

THE IRON AGE

A Review of the Hardware, Iron and Steel Trades.

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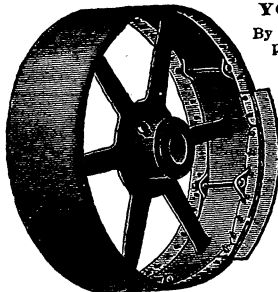
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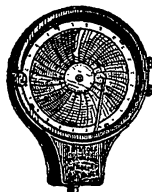
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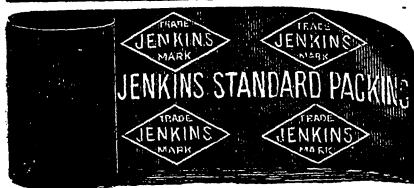
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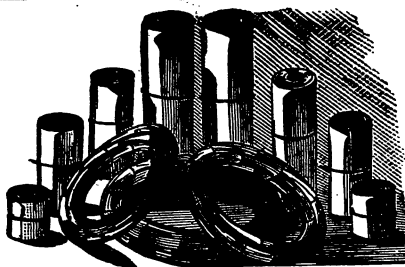
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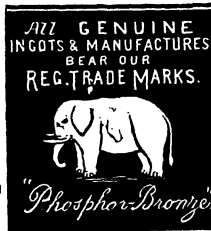
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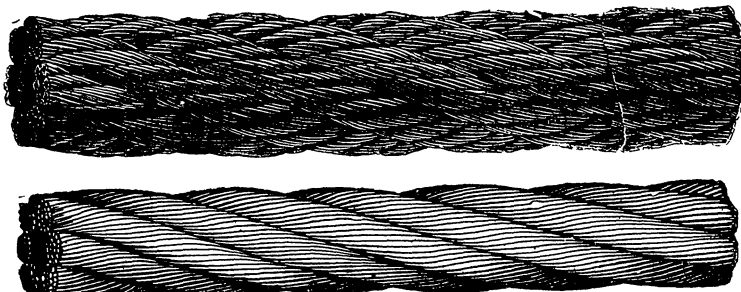
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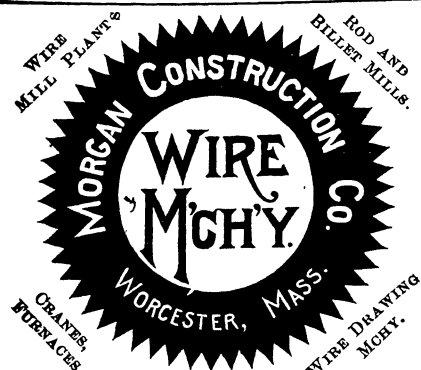
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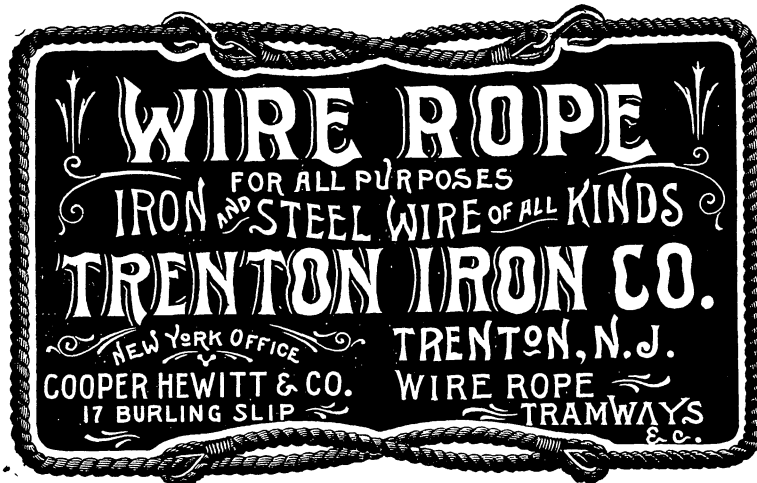
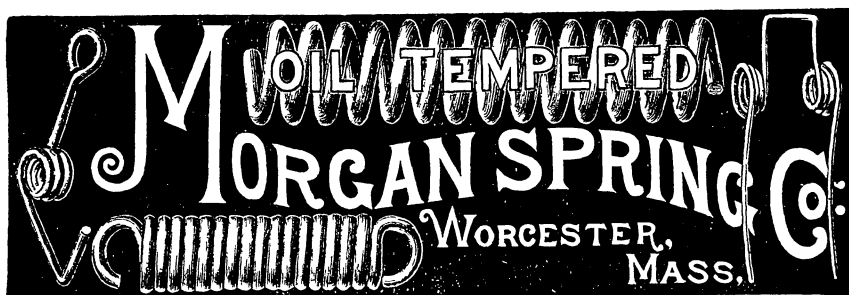
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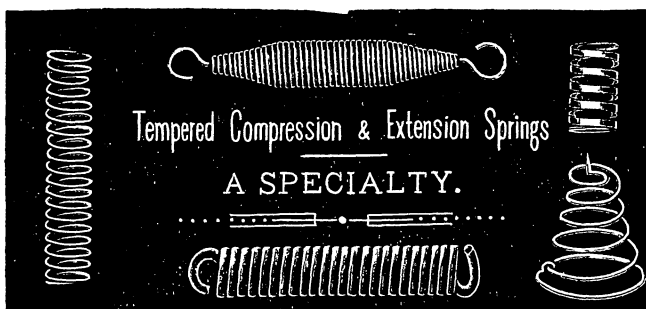
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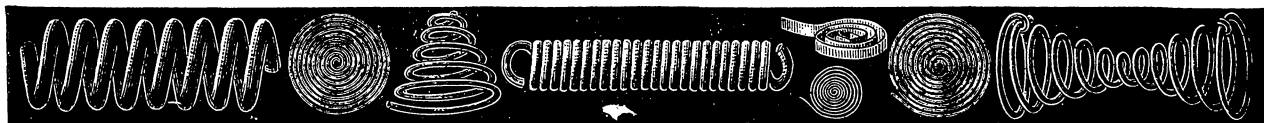
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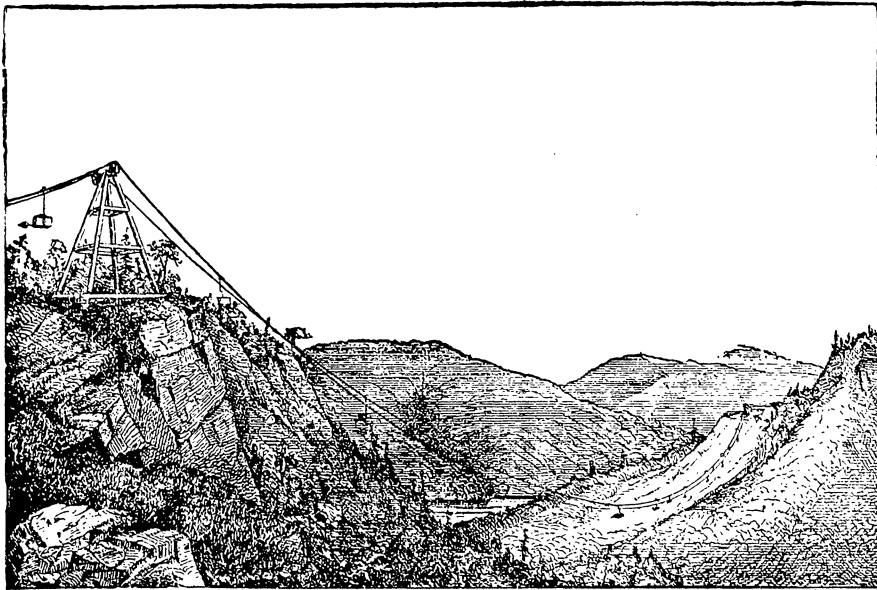
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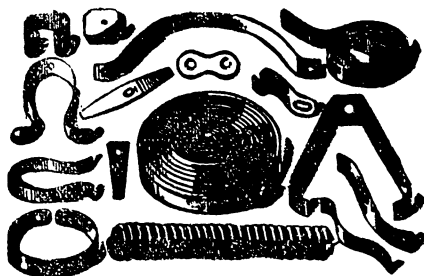
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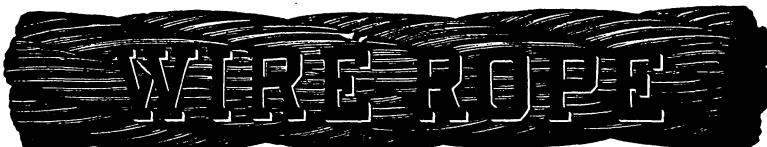
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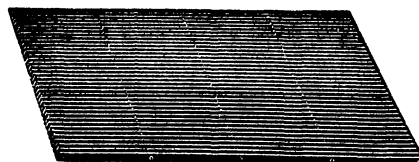
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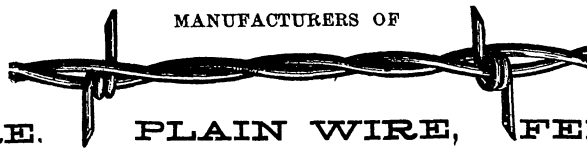
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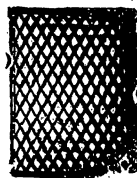


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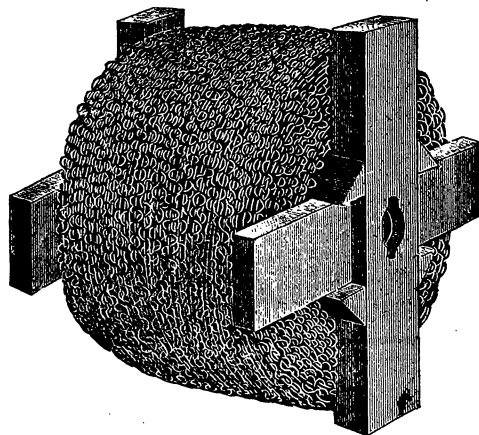
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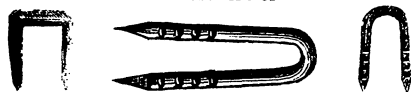
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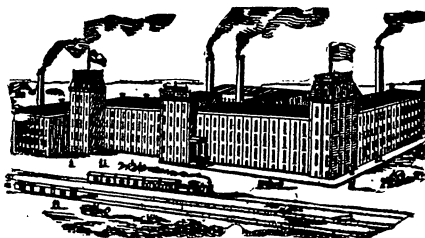
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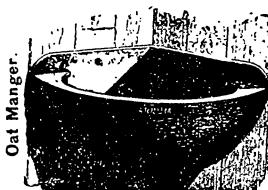
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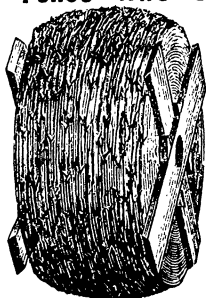
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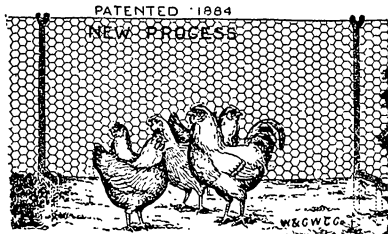
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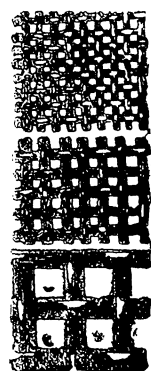
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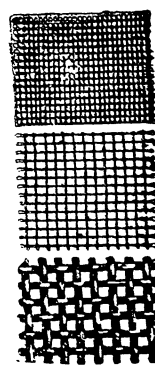
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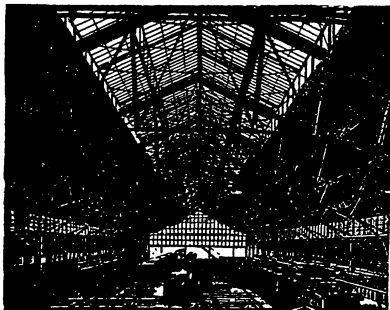
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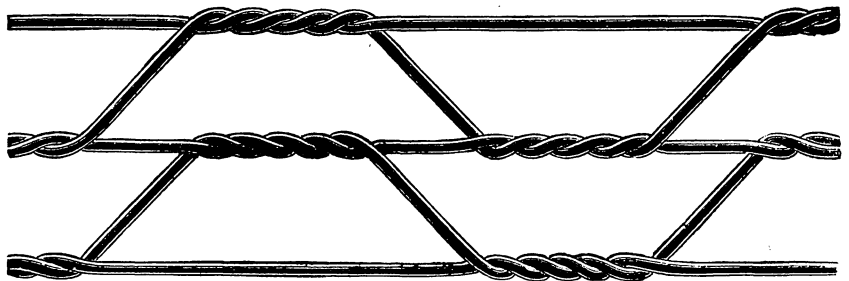
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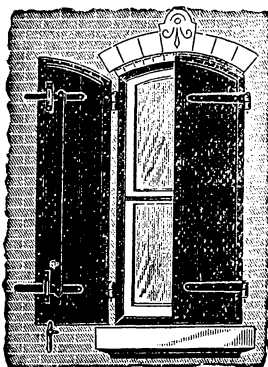


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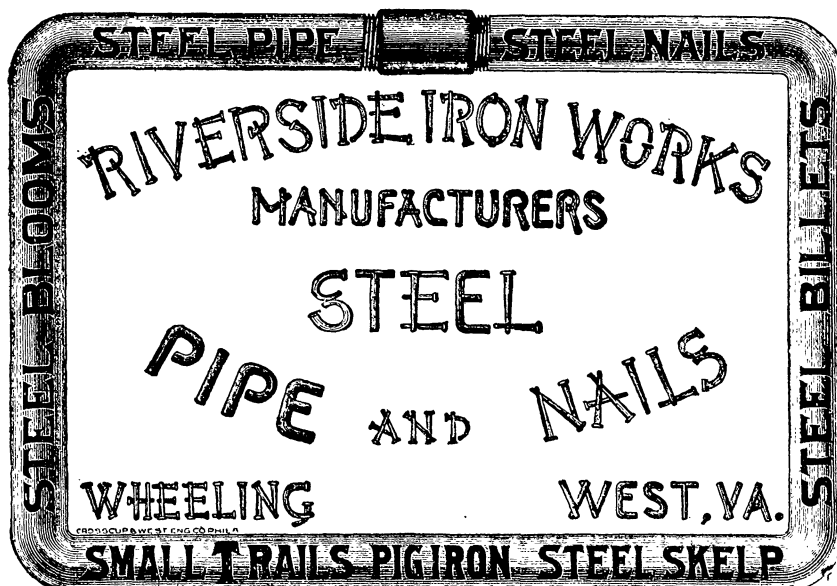


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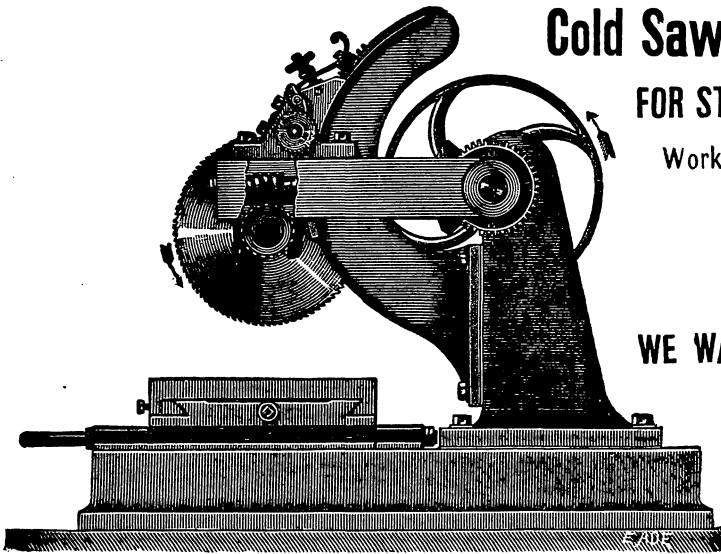
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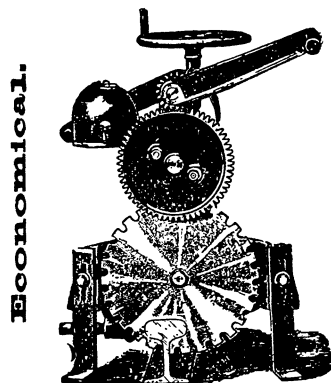
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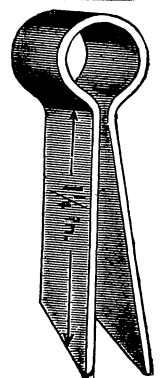
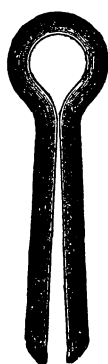
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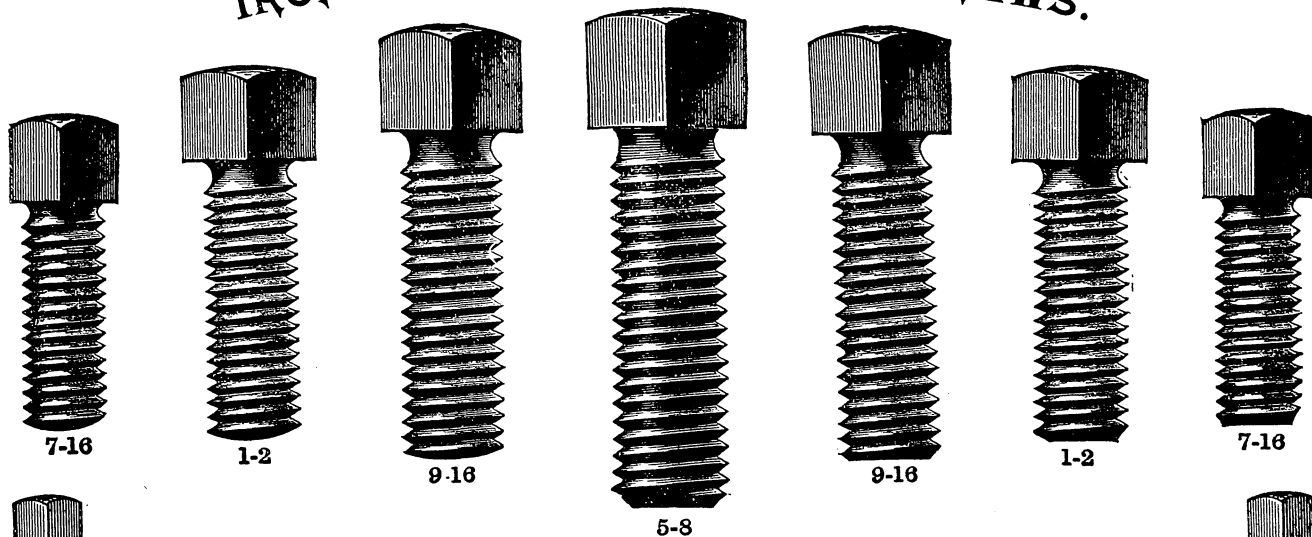
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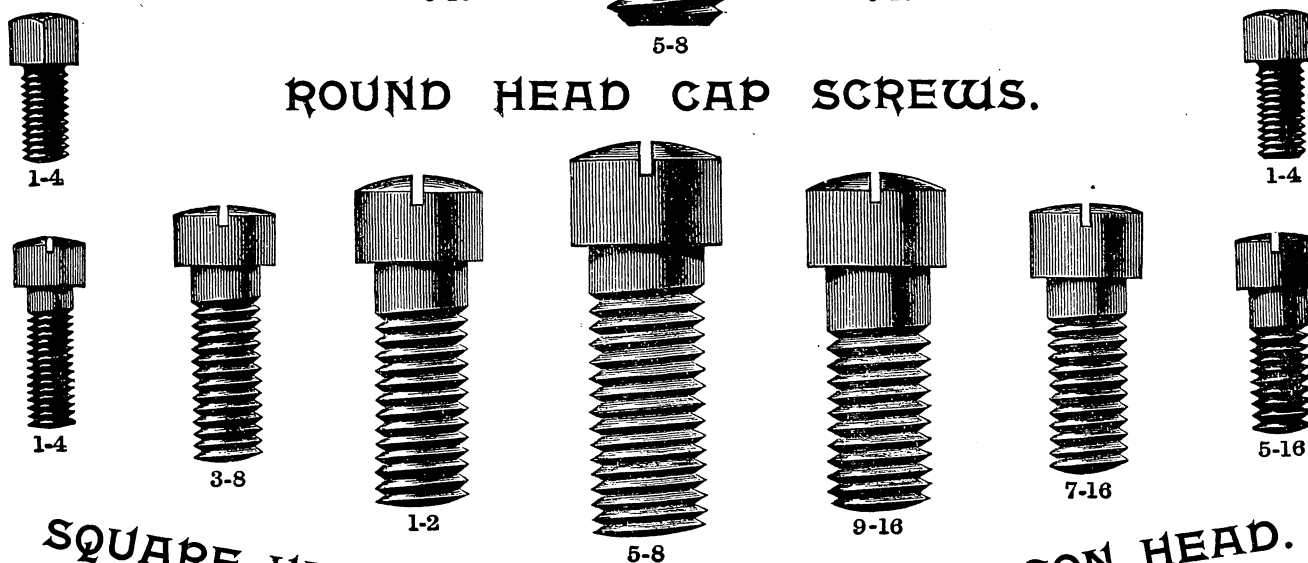
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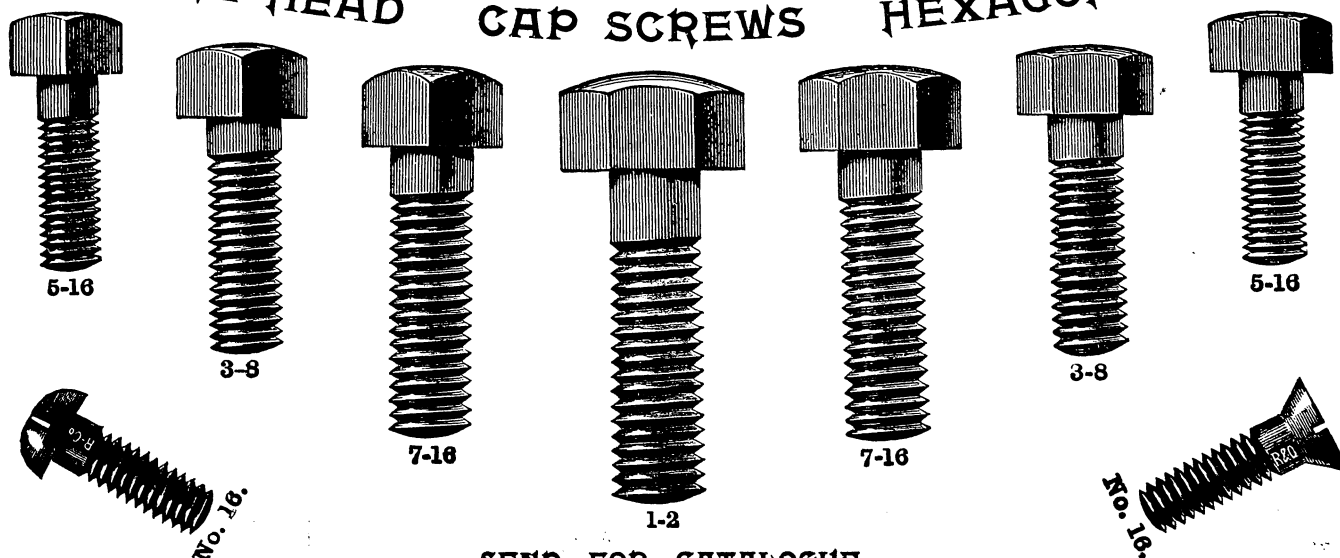
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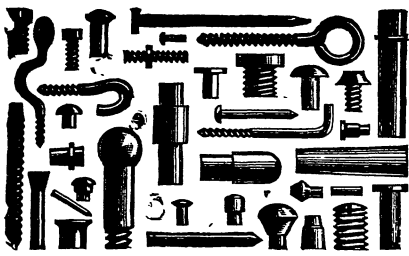
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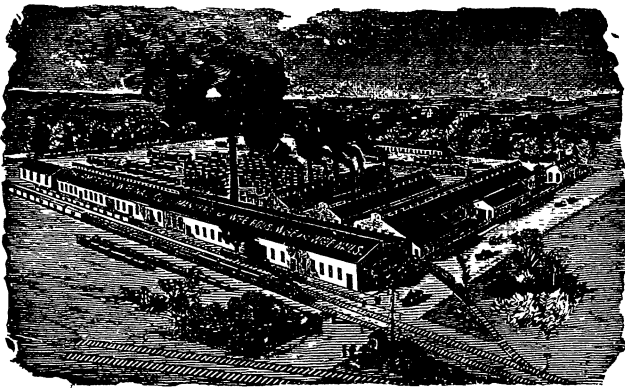
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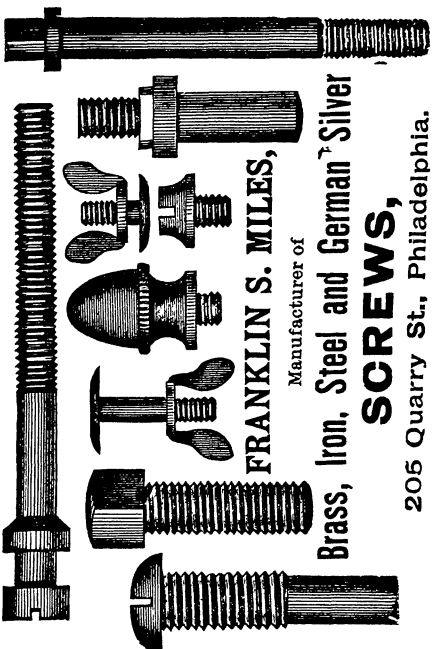
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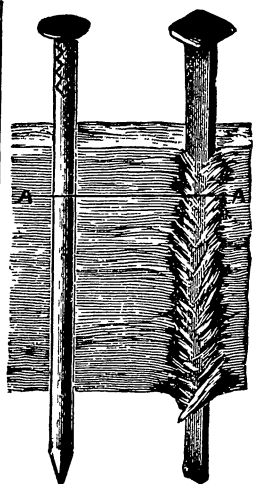
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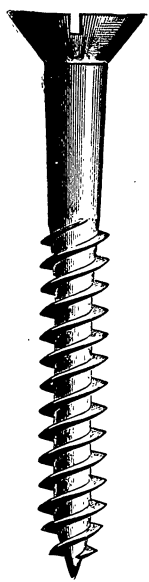
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"Spur Pointed" Wood Screw.

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ITS ADVANTAGES ARE:

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Forged nick.

Requires the use of only one bit.

Inserted easier.

Increased holding power.

Centralized point.

Is cold forged, and entire surface has a metallic skin.

Samples Sent on Application.

Patented Nov. 11, 1890, Oct. 20, 1891.



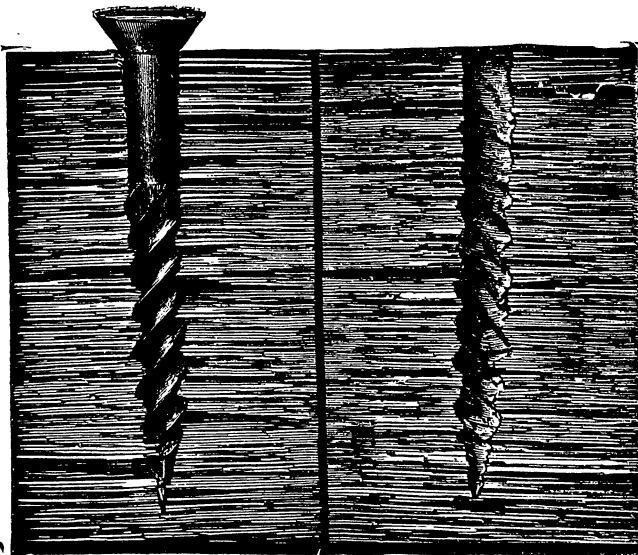
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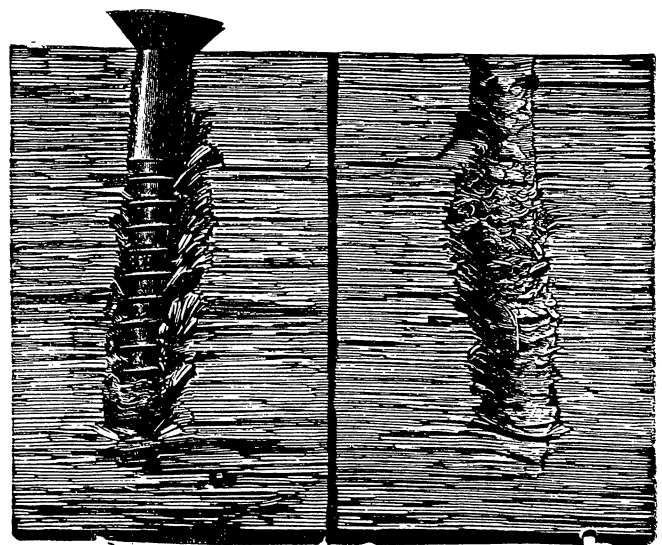
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List prices, same as common iron wood screws. Discount for Flat Heads, 82½%.



THE "ROGERS DRIVE SCREW,"

Driven with a hammer its entire length.



A COMMON CUT THREAD SCREW,

As ordinarily inserted, i. e., driven two thirds of its length with a hammer and the balance with a screw-driver. Fibres of the wood are necessarily broken, and holding power of screw much impaired.

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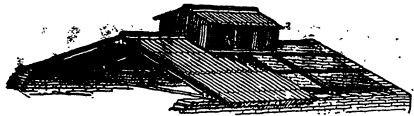
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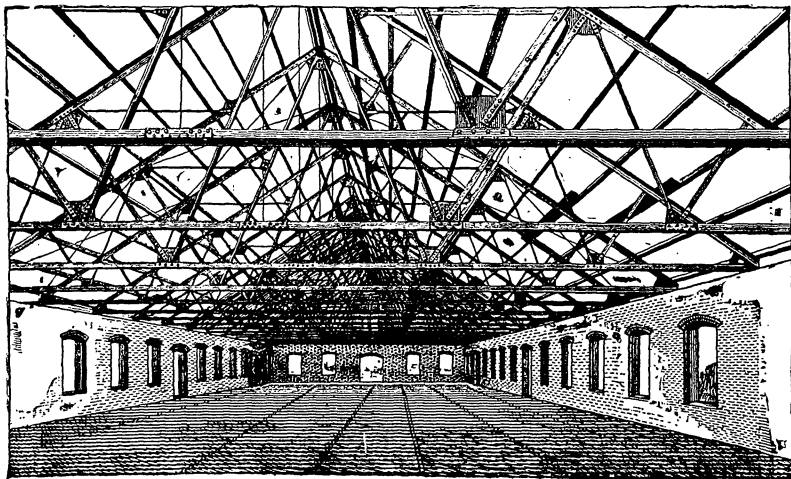
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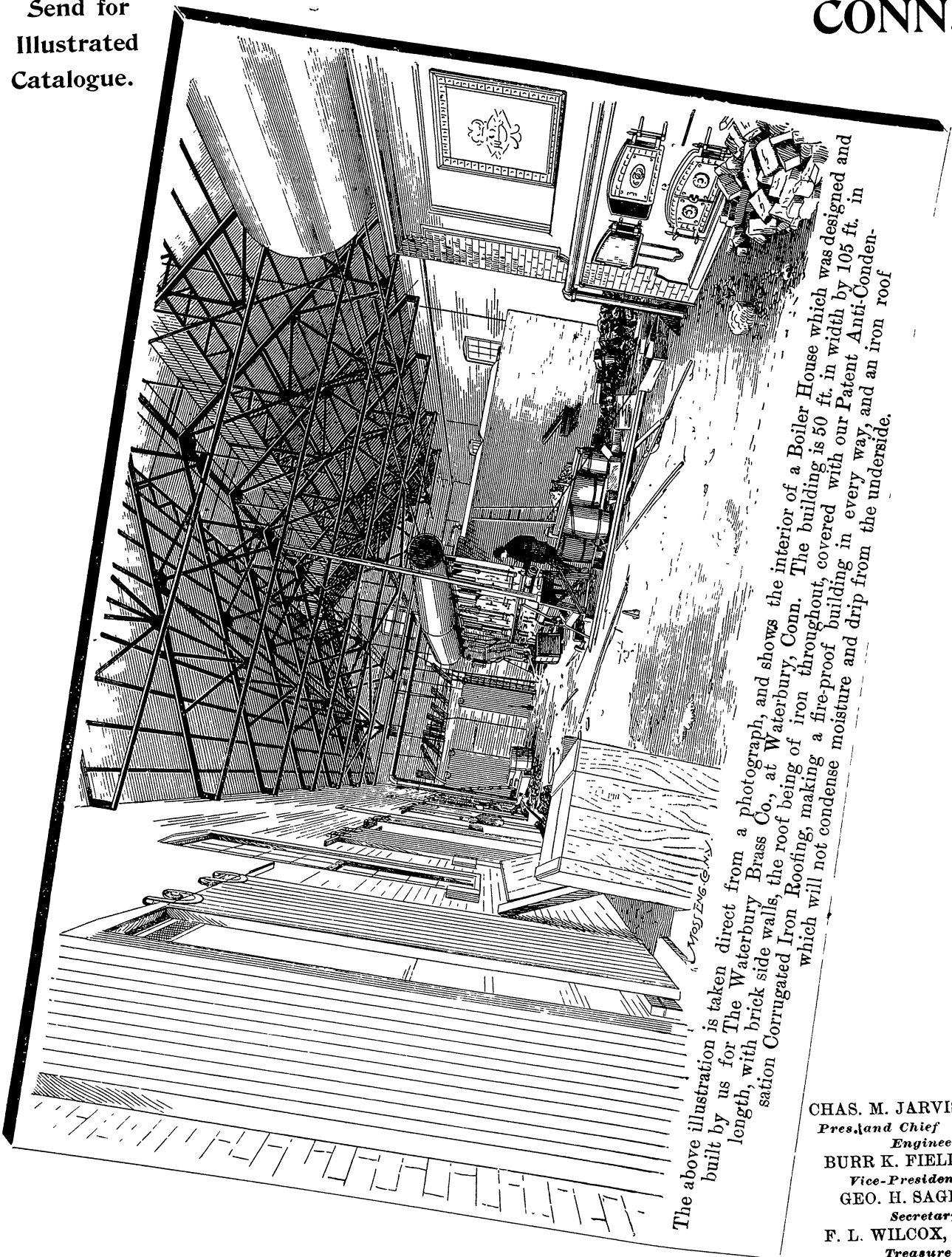
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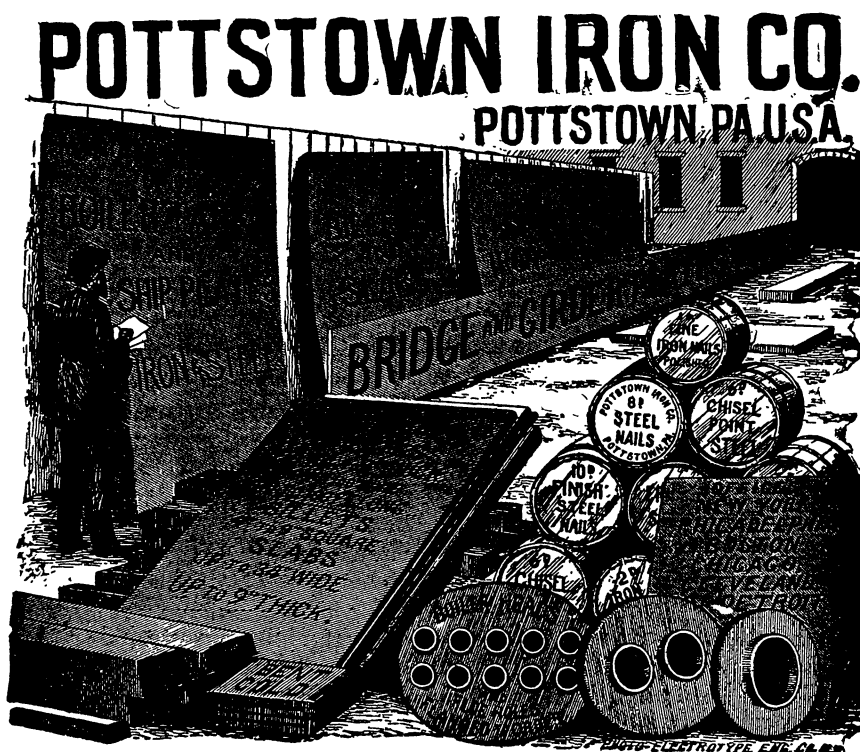
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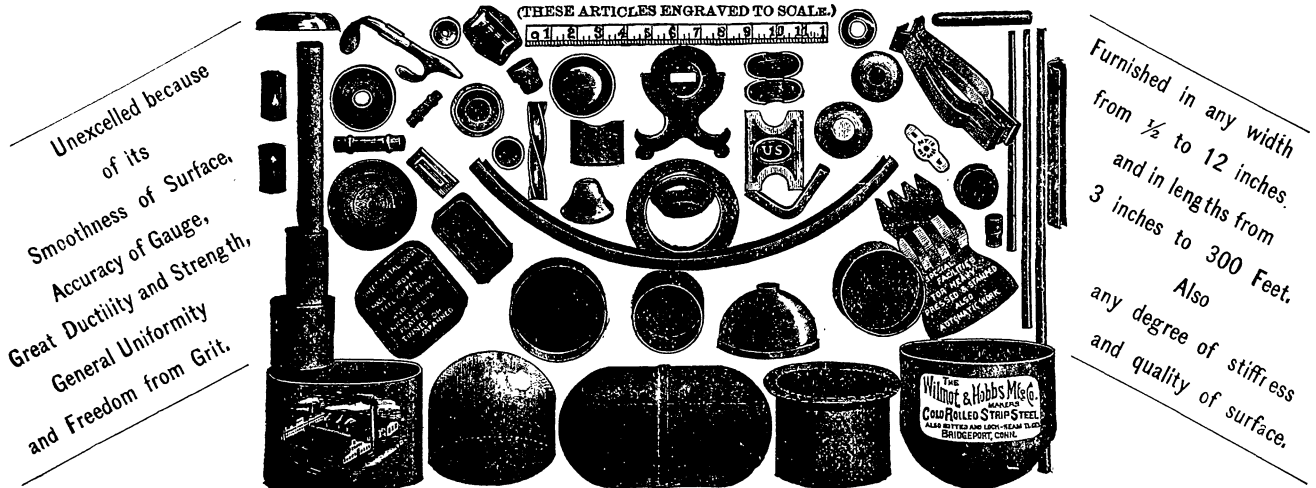
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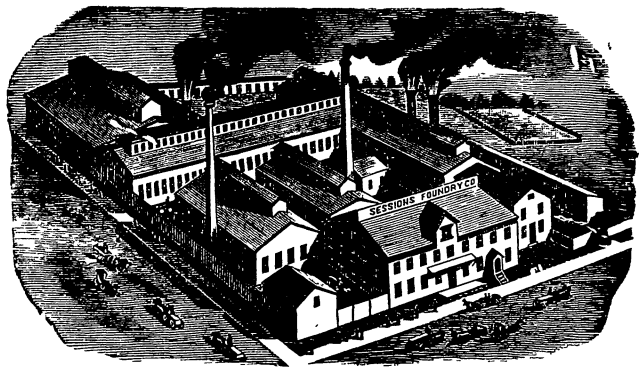
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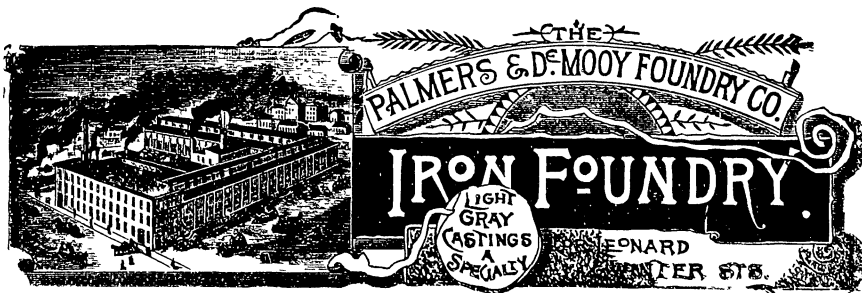
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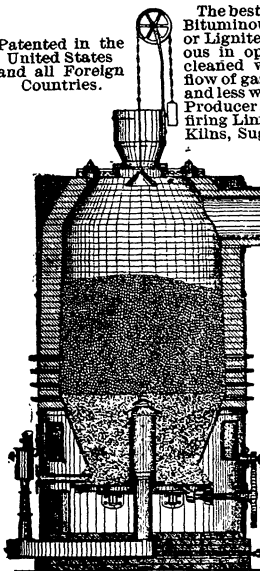
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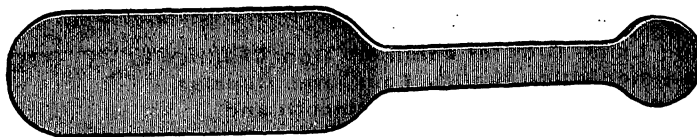
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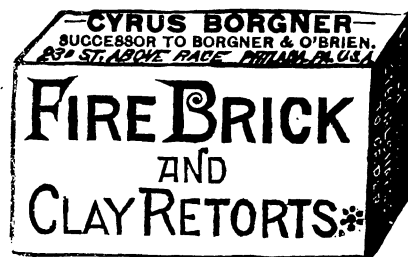
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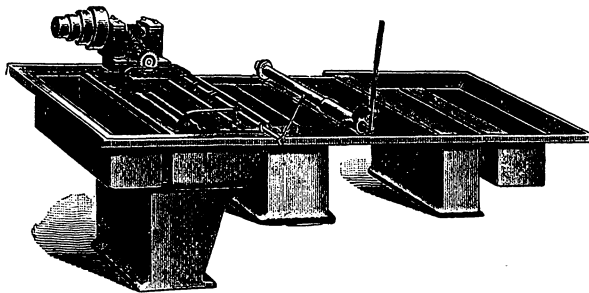
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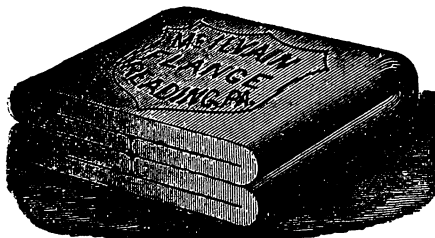
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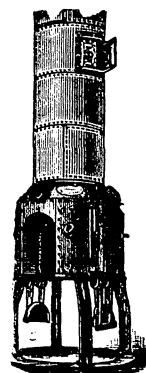
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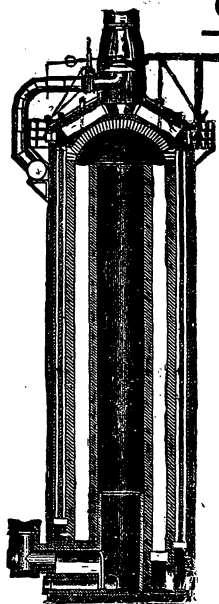
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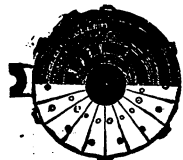
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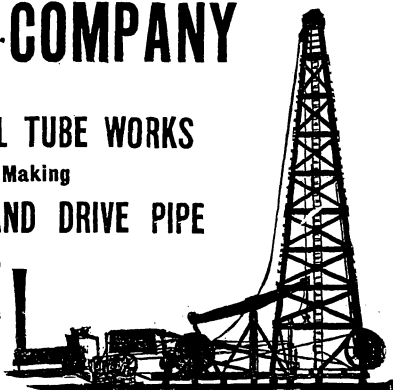
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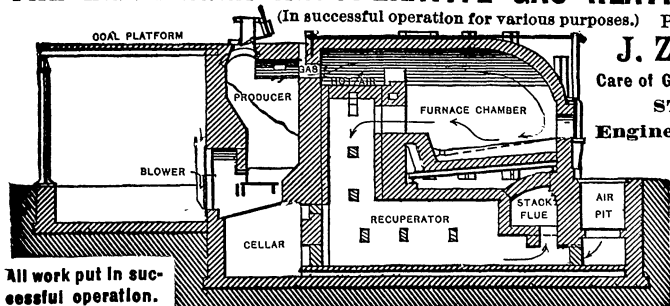
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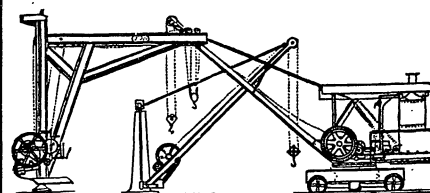
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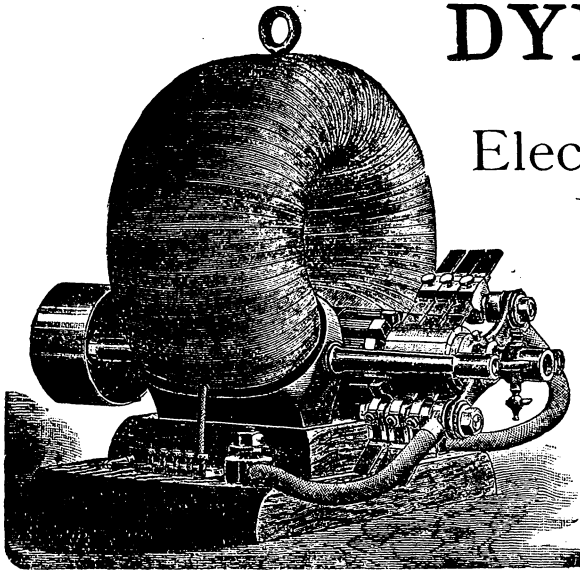
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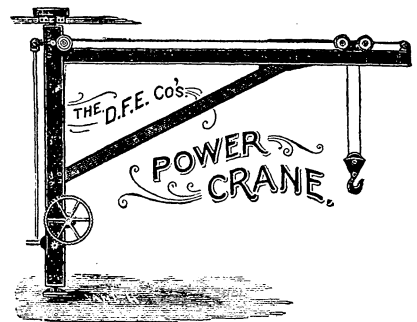
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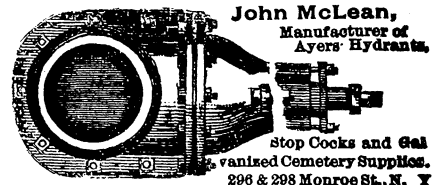
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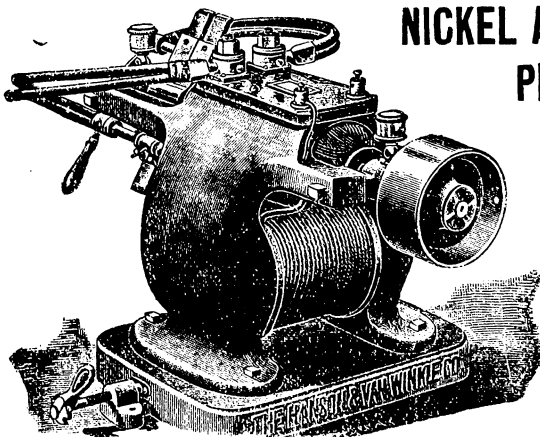
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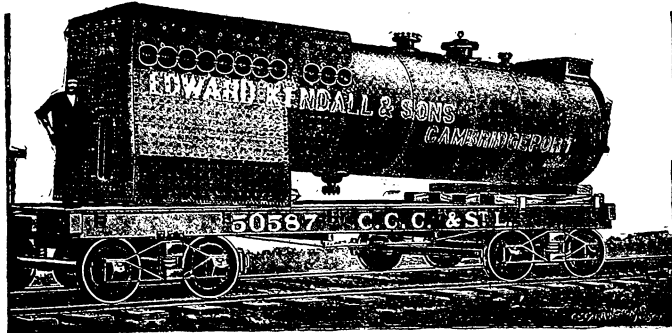
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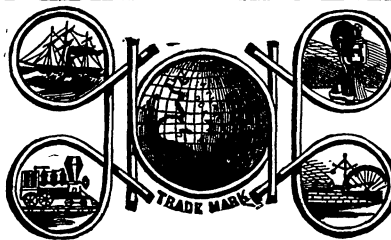
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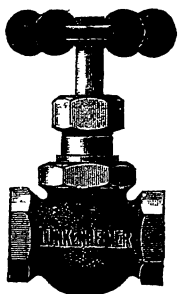
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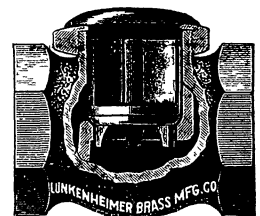
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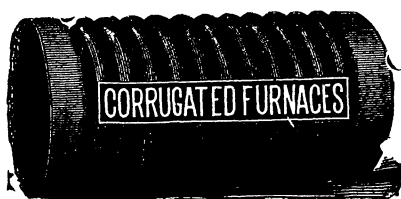
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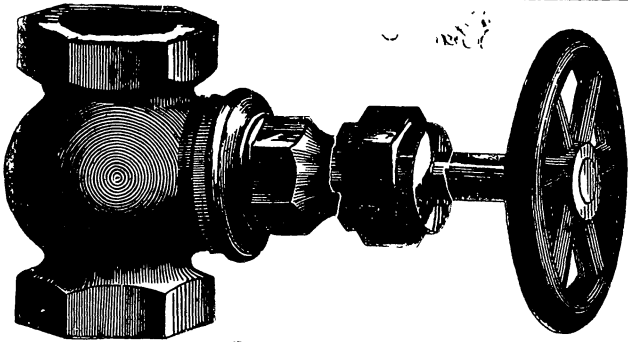
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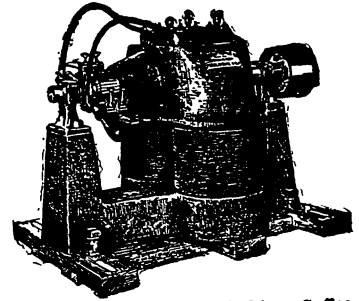
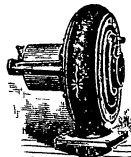
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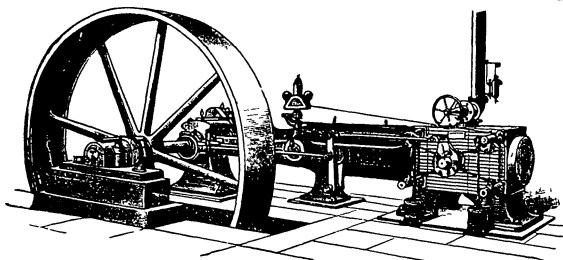
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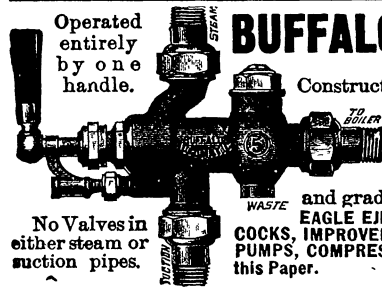
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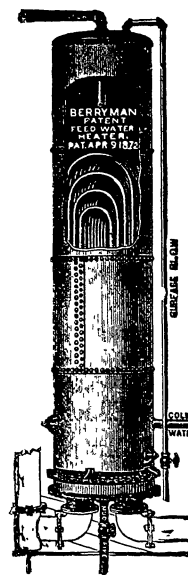
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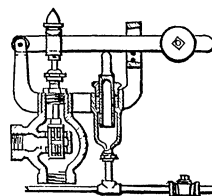
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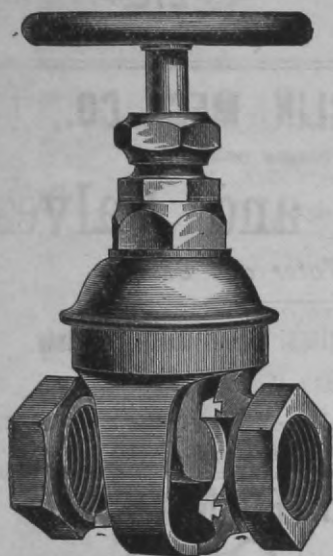
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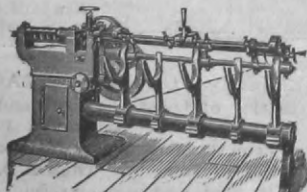
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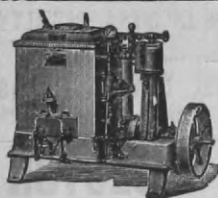
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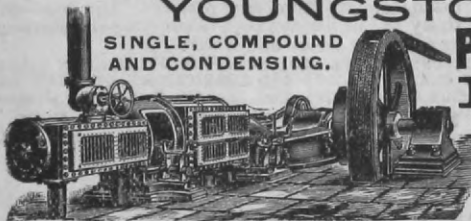
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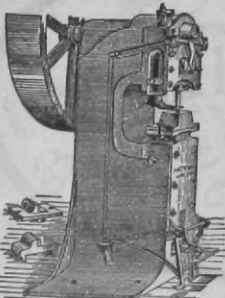
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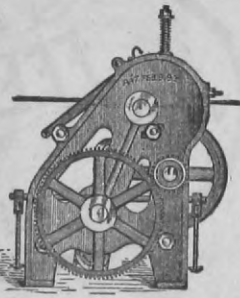
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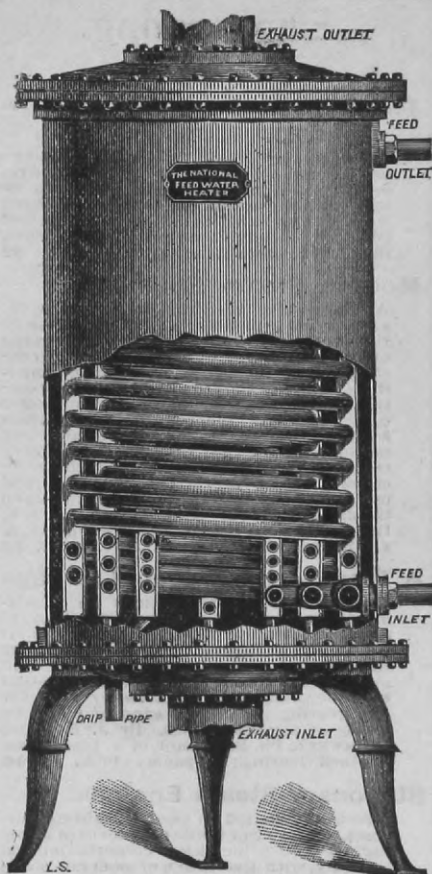
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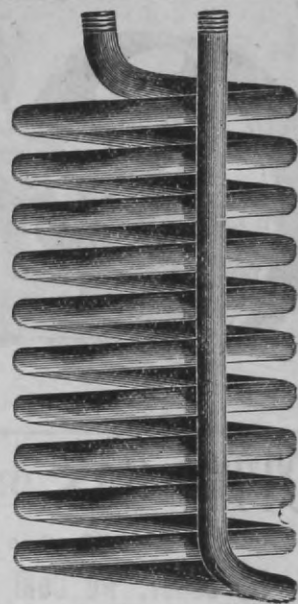
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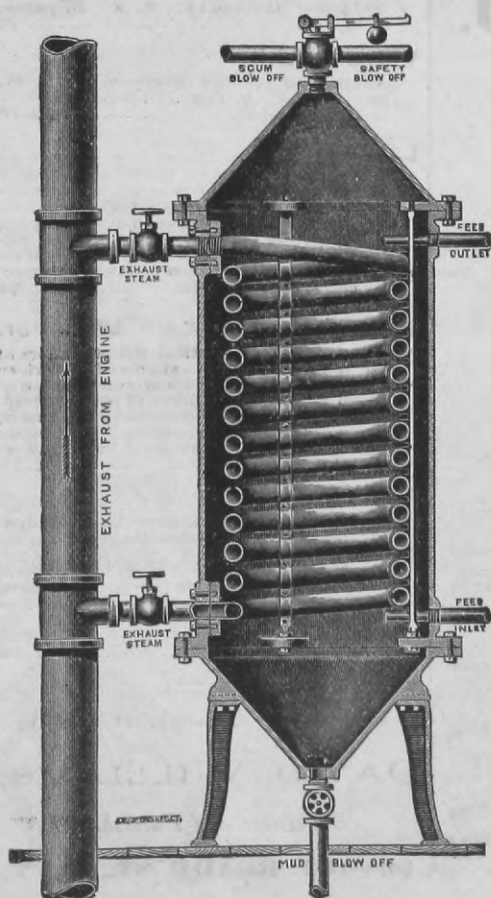


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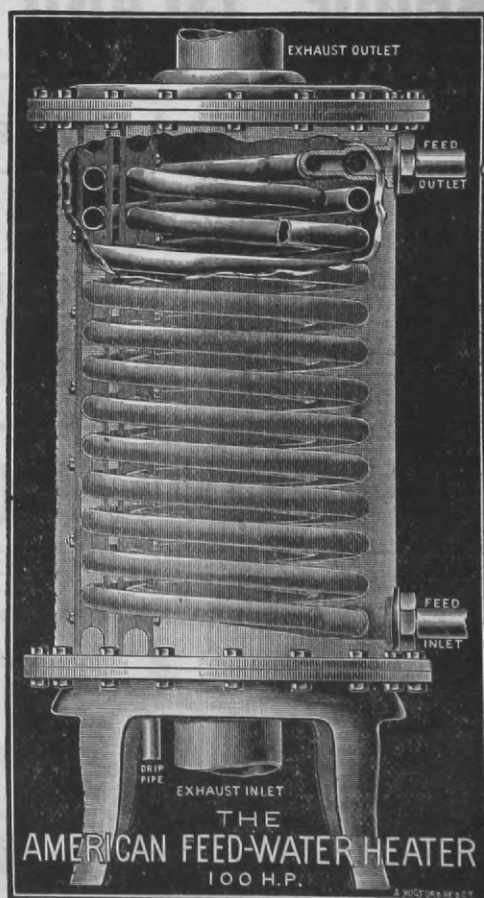
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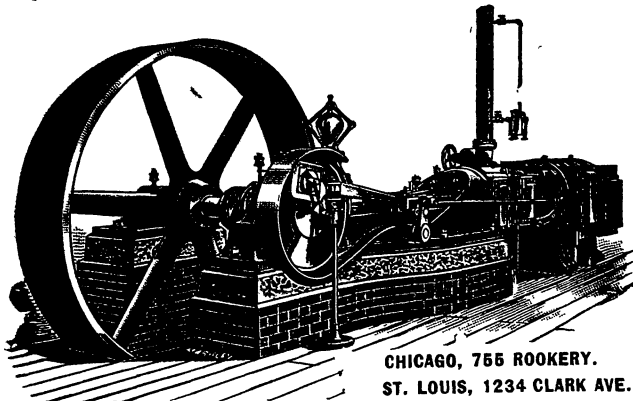
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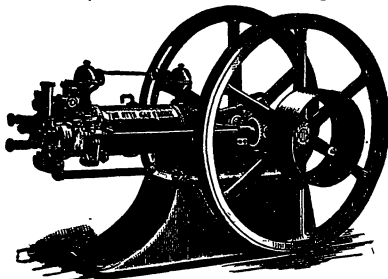
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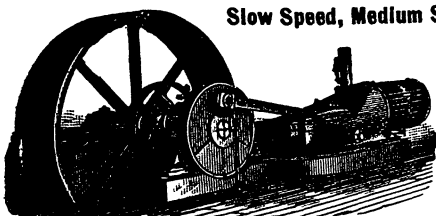
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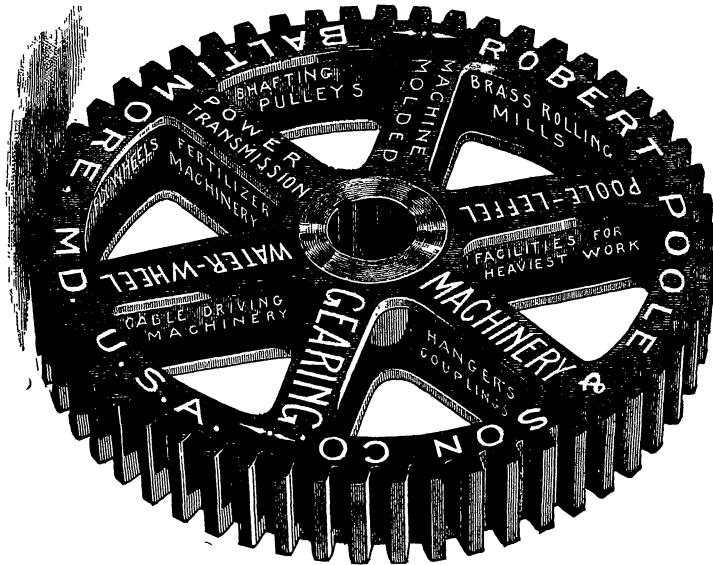
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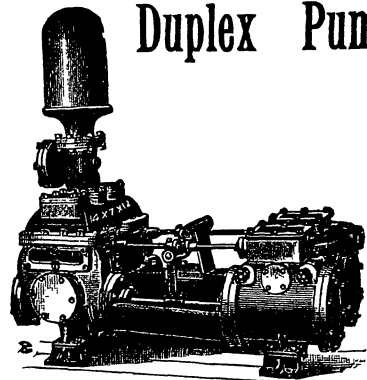
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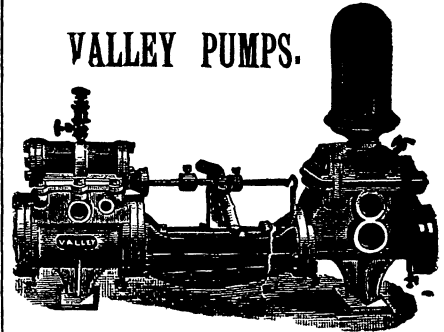
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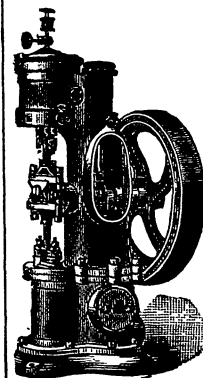


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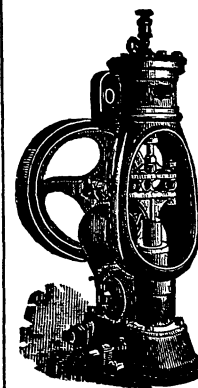


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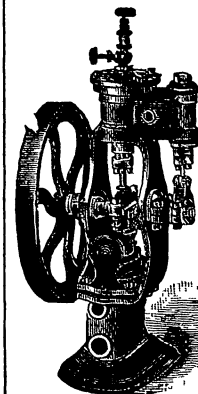
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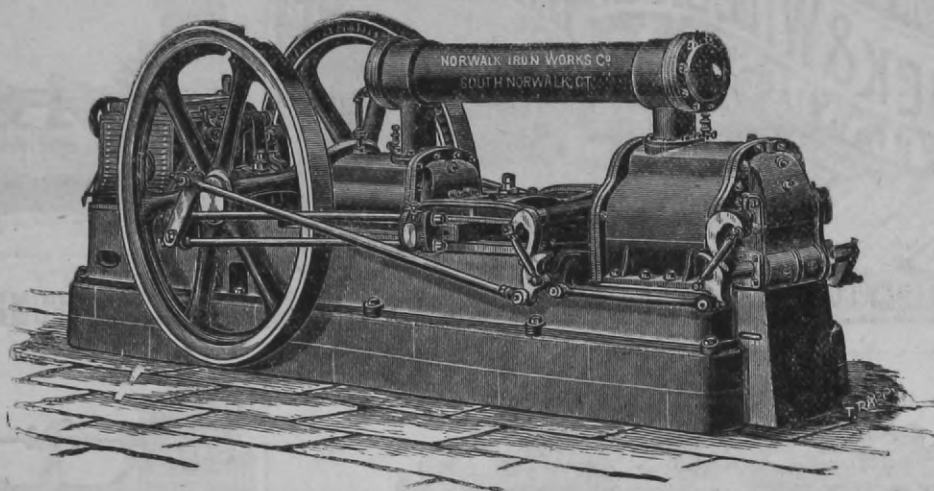
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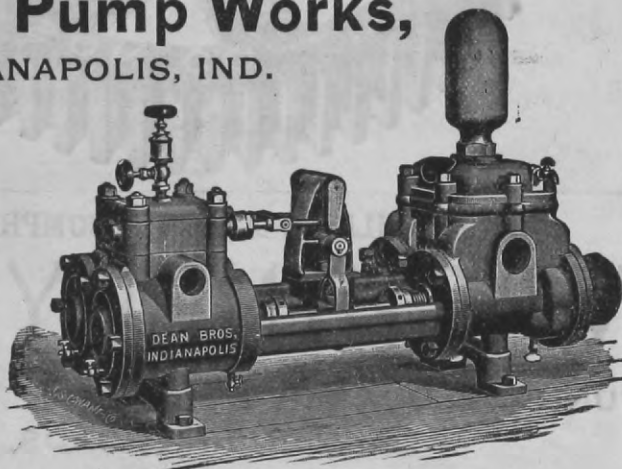
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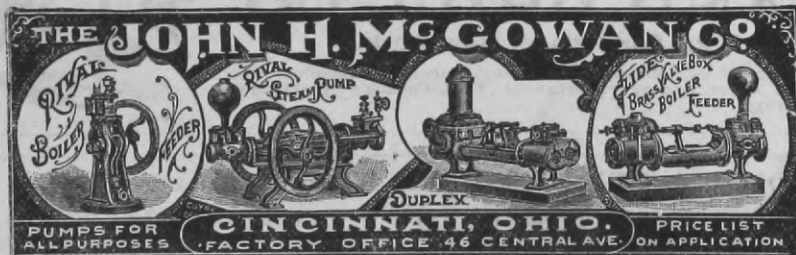
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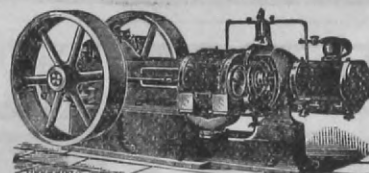
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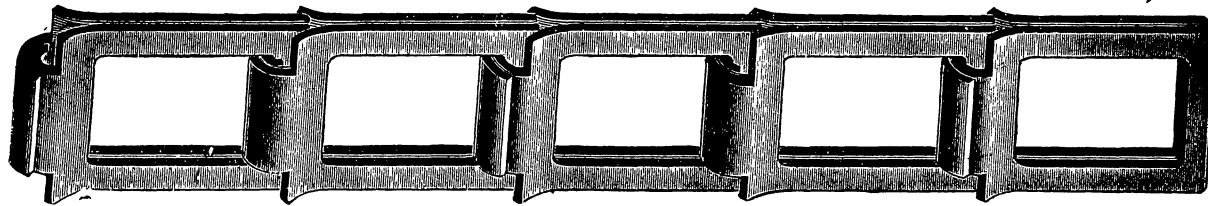
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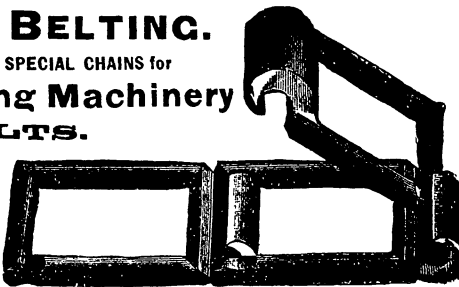
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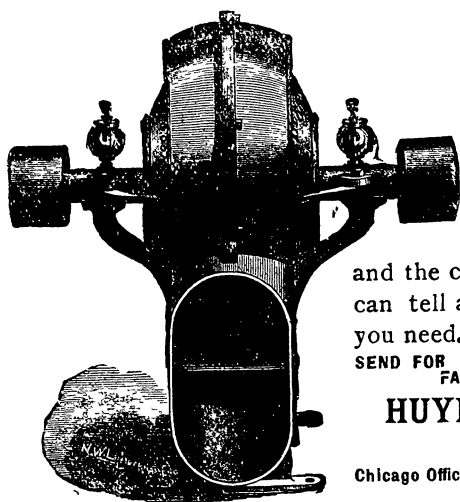
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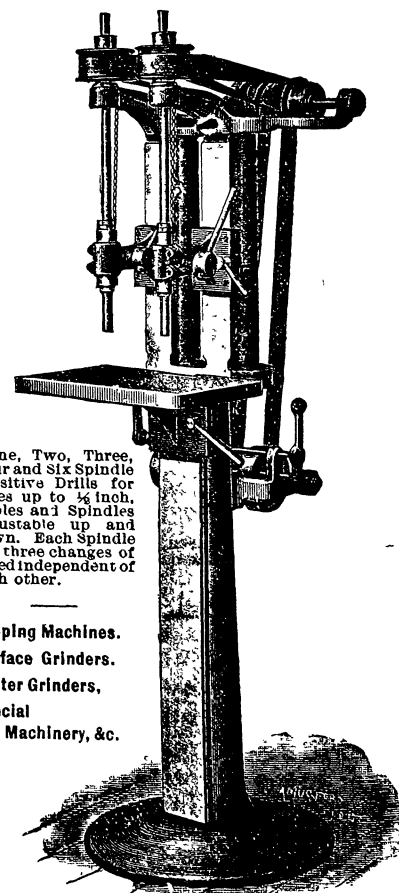
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Positively unequalled for Strength, Durability and Traction Power; unaffected by Heat, Steam or Water.

Belts for Main Driving and work of a heavy nature a specialty.

MAIN BELTING COMPANY

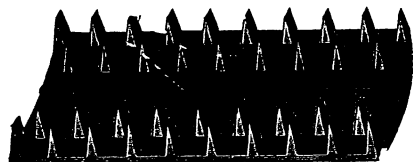
Sole Manufacturers.
1219-1235 Carpenter St.
PHILADELPHIA.

248 Randolph Street, Chicago.

120 Pearl Street, Boston.

Send for Price-Lists and Samples.

Talcott's Original Wilson Belt Hooks.

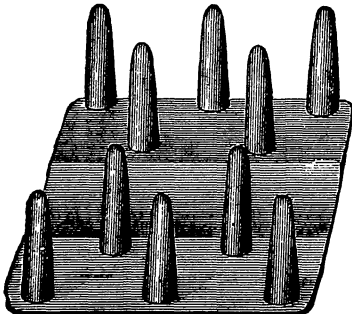


W. O. TALCOTT, Providence, R. I.

MANUFACTURER OF

Four Styles of BELT HOOKS, Including 134 Sizes.
SEND FOR CATALOGUE.

Thacher's Patent BELT FASTENERS.



Manufactured by
The Claffen Manufacturing Co., Cleveland, O.
Office, 71 and 73 Ontario St.

FOR THE 'Double Triple Quick Stroke' SHAPER WRITE TO GOULD & EBERHARDT, Newark, N. J.



12 in., 16 in., 20 in., 24 in., 26 in., 30 in. stroke.

NEW YORK BELTING & PACKING CO.

(LIMITED.)

JOHN H. CHEEVER,
Manager.

15 Park Row, New York.

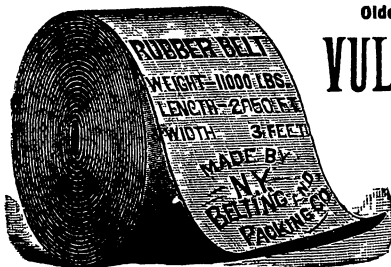
Oldest and Largest Manufacturers in the U. S. of

VULCANIZED RUBBER FABRICS

For Mechanical Purposes.

MACHINE BELTING

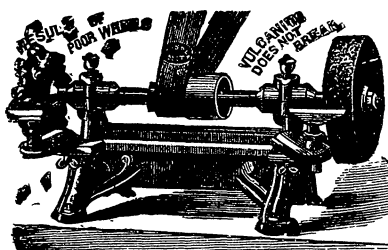
With Smooth Metallic Rubber Surface.



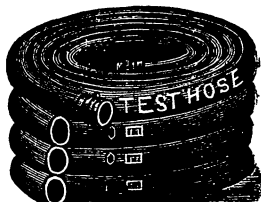
RUBBER TEST HOSE

COTTON "CABLE" HOSE, CIRCULAR, WOVEN, SEAMLESS, ANTISEPTIC.

For the use of Steam and Hand Fire Engines, Force Pumps, Mills, Factories and Steamers.



Rubber Cement.



THE ORIGINAL SOLID VULCANITE EMERY WHEELS.

RUN EASY and SAFE, COOL and TRUE, ARE MORE DURABLE—HENCE CHEAPER. A trial will convince you of this. KNIFE GRINDING WHEELS A SPECIALTY.

Rubber Goods to Order for all Mechanical Purposes.

SALESROOMS:

PHILADELPHIA, 308 Chestnut St.
BOSTON, 52 Summer St.
CHICAGO, 151 Lake St.
DENVER, 1601-1611 17th St.
CHARLESTON, 160 Meeting St.
GRAND RAPIDS, 4 Monroe St.
MINNEAPOLIS, 28 South 2d St.
CLEVELAND, 176 Superior St.
European Branch:—98 and 100 Queen Victoria St., London, England.

SALESROOMS:

SAN FRANCISCO, 17 Main St.
DETROIT, 16-20 Woodward Ave.
BALTIMORE, 12 N. Charles St.
NEW ORLEANS, 8-12 N. Peters St.
KANSAS CITY, 1811 and 1813 W. 12th St.
ST. LOUIS, 616 Locust St.

MOULDED

RUBBER GOODS

FOR MECHANICAL PURPOSES.

H. O. CANFIELD.

BRIDGEPORT, CONN.

Small moulded work a specialty. Send for estimates for moulds and work.

Brief Summary of Tests

By Prof. R. H. Thurston, for the purpose of correcting some misconceptions about the lubricating value of graphite.

FIRST TEST.	Quantity in milligrams.	Pressure on bearing per square inch.	Number of revolutions per minute.	Time in minutes till the bearings "squealed."	Total No. of feet friction surface traveled.
Best Sperm Oil.....	335.....	48 lb.....	2,000.....	11.....	7,198
Dixon's Perfected Graphite, mixed with enough water to distribute it over bearings....	120.....	48 ".....	2,000.....	30.....	19,635

NOTE.—Under same number of pounds pressure and traveling at same rate of speed the graphite did nearly three times more work than the best quality of winter sperm oil.

SECOND TEST.	Quantity in milligrams.	Pressure on bearing per square inch.	Number of revolutions per minute.	Time in minutes till the bearings "squealed."	Total No. of feet friction surface traveled.
Best Sperm Oil.....	335.....	60 lb.....	2,000.....	51.....	33,360
Best Quality of Lubricating Grease	335.....	60 ".....	2,000.....	51.....	33,360
Same Grease containing 15% Dixon's Perfected Graphite	335.....	60 ".....	2,000.....	293.....	194,941

NOTE.—The grease without the graphite gave no better results than the sperm oil; but when 15% by weight, of Dixon's Perfected Graphite was added the bearings were run nearly six times longer at the same high rate of speed. Furthermore, where the graphite was used there was no cutting and the bearings were in perfect condition.

Let us send you FREE OF CHARGE our Pamphlet. It is interesting and instructive.

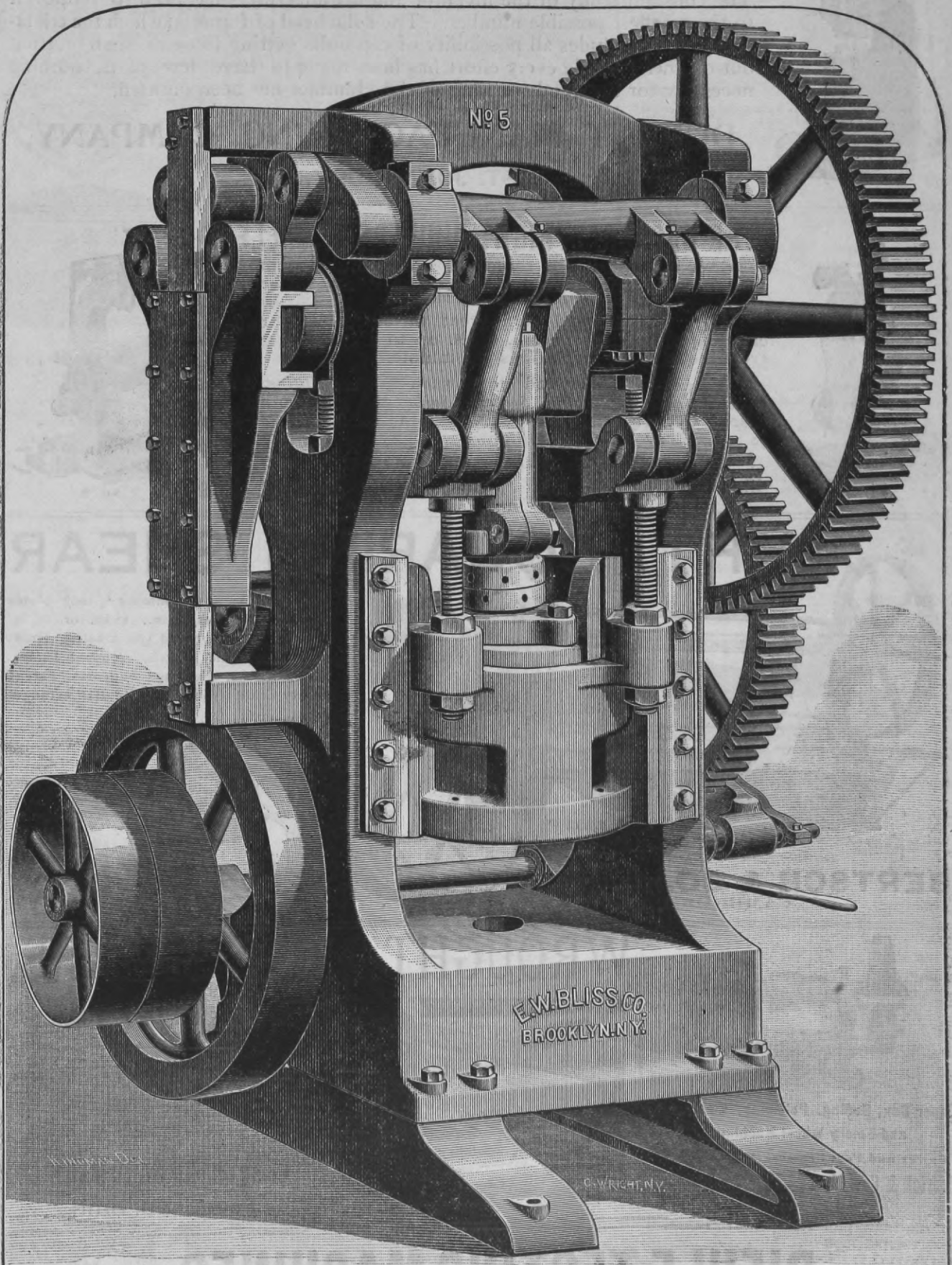
JOS. DIXON CRUCIBLE CO.,

JERSEY CITY, N. J.

E. W. BLISS CO.,

11 ADAMS STREET,
BROOKLYN, N. Y.

WESTERN OFFICE: 14 N. CANAL ST., CHICAGO.



Presses, Shears, Drop Hammers, Dies and Special Machinery.

Owners also of **THE STILES & PARKER PRESS CO.**

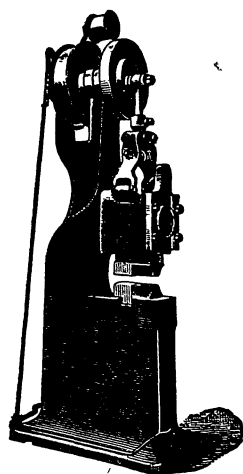
The Dupont Power Hammer.

ITS POINTS OF SUPERIORITY.

No. 2. SIMPLICITY OF CONSTRUCTION.

No Hammer made at the present time has less parts than this one. The constant study of the inventor and manufacturers has been to reduce it to the smallest possible number. The solid head of frame in which the crank-shaft runs precludes all possibility of cap bolts getting loose or shaft getting out of line. While every effort has been made to have few parts, nothing necessary for the good working of the Hammer has been omitted.

DUPONT MANUFACTURING COMPANY,
ST. JOHNSBURY, VT.



THE BECKER UPRIGHT UNIVERSAL MILLERS

Have a remarkable range of utility and are more indispensable than common horizontal millers.

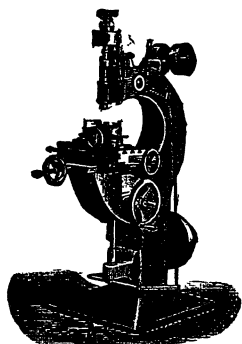
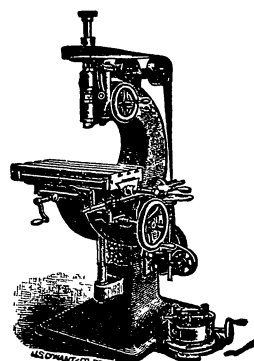
No. 2 is adapted for a great variety of light milling, carrying mills from 1-32 in. diam. up to 2 in. diam. Speeds from 100 to 10,000 revolutions per minute.

No. 3, for all round work, such as *Face Milling, Milling Dovetail Slides, Key Seating, Splining, Boring* and many other purposes. Carries mills from 1-8 in. to 4 in. diam. Speeds from 40 to 2000 revolutions per minute.

SEND FOR CATALOGUE.

JOHN BECKER MFG. CO.,

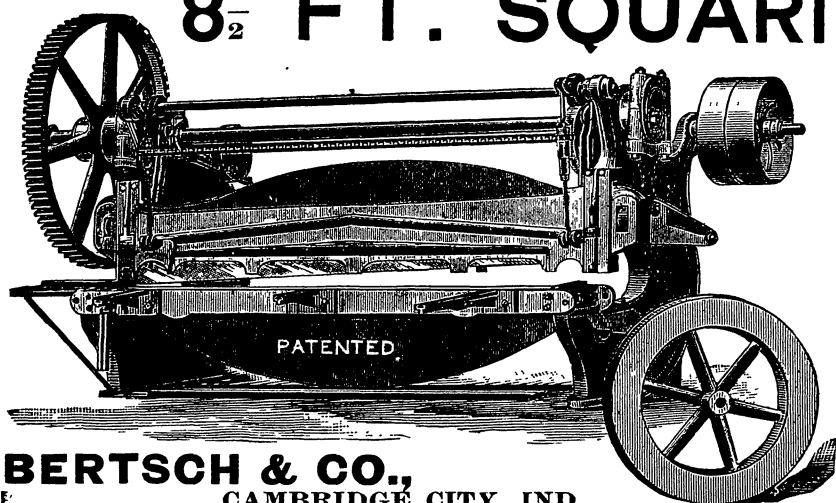
Fitchburg, Mass



NO. 2.

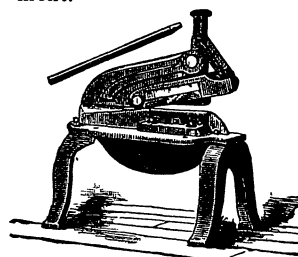
NO. 3.

8 ¹/₂ FT. SQUARING SHEAR

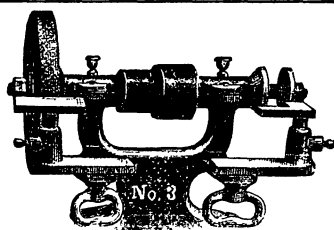


BERTSCH & CO.,
CAMBRIDGE CITY, IND.

For squaring and trimming 1/4-inch plates and lighter; has 15 in., 18 in. or 21 in. throat; has Improved Quick-acting Hold-down Automatic Clutch, Drop-leaf Tables Patent Center Bearings Supports, Patent Safety Cross Head or Knife Bar arrangement.



Improved Compound Lever Stock Shears. Three Sizes: adapted for Slitting, Trimming and Squaring Sheets, &c.



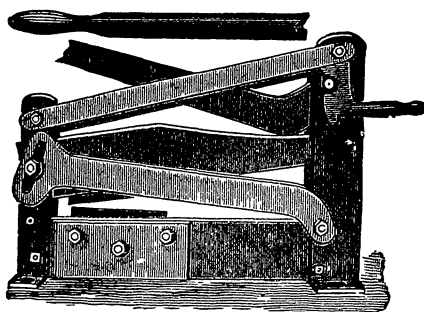
Paper Box, Buffing, Polishing, Electrotypes and Emery Wheel Machinery.

Power and Foot Presses. Drill Presses.

Herrick & Cowell, 37 Artisan Street, NEW HAVEN, CONN.
Send for Catalogue.

WROUGHT IRON SHEARS,

For Cutting Iron and Plow Steel.



This machine will cut 4 x 5/8 flat Iron and 1 1/2 in. round or square.

MANUFACTURED BY

The CLEVELAND HARDWARE CO.
CLEVELAND, OHIO.

FOR TESTING IRON AND STEEL SPECIMENS, CAR COUPLERS BRAKESHOES, CHAIN SPRINGS, WIRE, CEMENT, &c., &c.

RIEHLE TESTING MACHINES,

HYDRAULIC PUMPS AND PRESSES, ROBE JACKS, MARBLE MACHINES.

Riehle Bros. Testing Machine Co.,
9th and Market Sts., Phila
N. Y. Office, 98 Liberty St

The Bradley Hammer.

If you plate, draw, square or taper iron and steel you need a
BRADLEY HAMMER.

If you swage, collar, spindle or do any manner of die work a
BRADLEY HAMMER will be a paying investment.

If you do a large amount of this work a BRADLEY HAMMER
will pay for itself more than once in a year,

It will pay for itself by what it will save over any other method
of doing the work.

A very small fraction of a cent saved on each of many thousand
forgings rapidly rolls up into money.

Then count the satisfaction of producing thousands of forgings
always just alike.

And the profit sure to follow from having a hammer that is al-
ways ready for business and not an expensive experiment

We manufacture power hammers in Cushioned Helve, Upright Strap and Beaudry Styles
Send for Catalogue and Price-List.

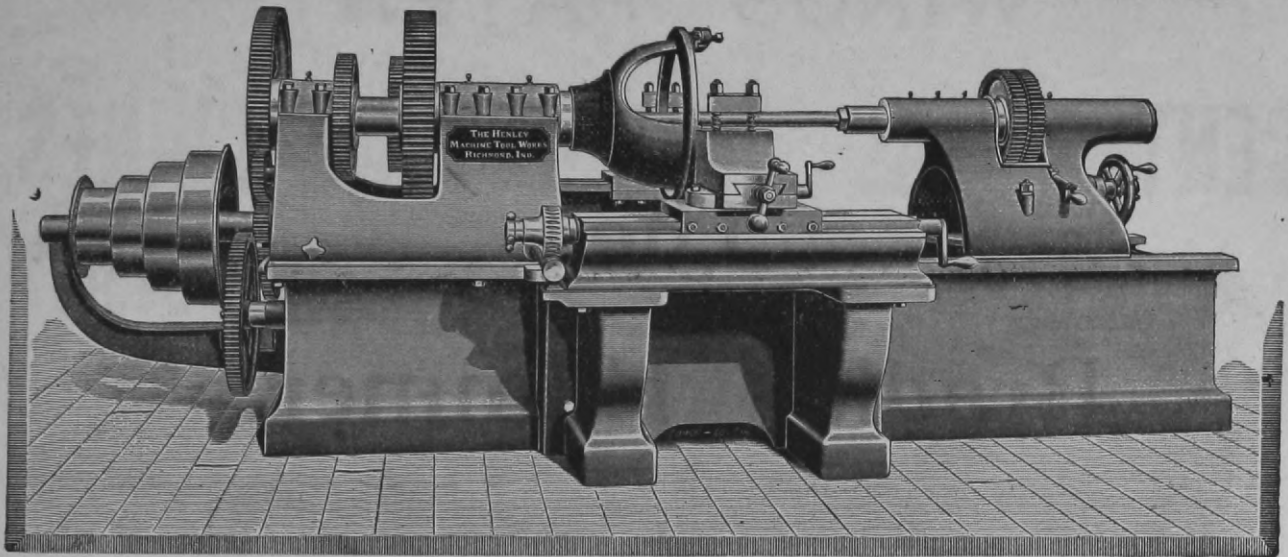
Bradley & Company,

SYRACUSE, N. Y.

BRANCHES:

BOSTON 96 & 98 Sudbury St. **NEW YORK,** 14 Warren St.

PULLEY LATHES



Patented Feb. 17, 1891; June 14, 1887.

This cut represents the 42-inch Lathe. The 60-inch Lathe is of same design, but much heavier throughout. The 30-inch Lathe is of same general construction, with the bed supported on feet at each end.

These Lathes are especially designed for Simultaneously Boring and Turning Pulleys, both straight and crowning face, Cone Pulleys, Gear Blanks, and a variety of other work.

MANUFACTURED BY

THE HENLEY MACHINE TOOL WORKS, Richmond, Indiana.

GATES ROCK AND ORE BREAKER

NUMBER SOLD IN 1891 EXCELS ALL FORMER RECORDS.



2,500
IN USE.

We beg to announce the following Specialties for 1892:

A New Fine Crusher to Supplant Rolls.
A New Dry Ore Concentrator—The Card.
A New Wet Ore Concentrator.
The Cook Amalgamator.

Improved Cornish Rolls. Simple and Effective Grinding Pans, Stamp Mills, Driers, All Mining Machinery.

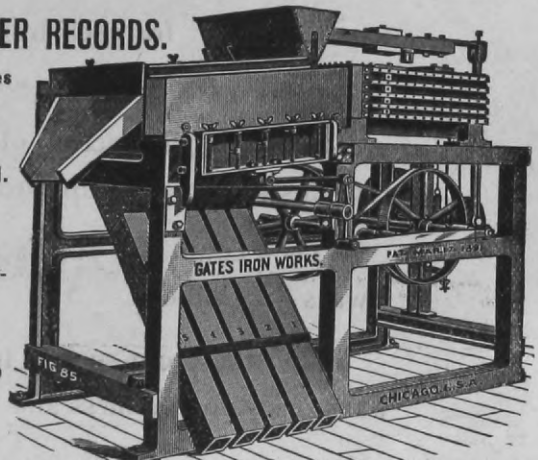
Gates Iron Works,

50-U-S. Clinton St., Chicago.

NEW YORK: 136 Liberty St.

BOSTON: 215 Franklin St.

LONDON, ENG.: 73 A Queen Victoria St



DRY CARD CONCENTRATOR.

The most successful machine made for PULVERIZING QUARTZ, ORES of all kinds, PHOSPHATE ROCK, CARBON, FOUNDRY FACINGS, PLUMBAGO, PORTLAND and ROCK CEMENTS, &c.

A PERFECT PULVERIZER

THE NEW GRIFFIN

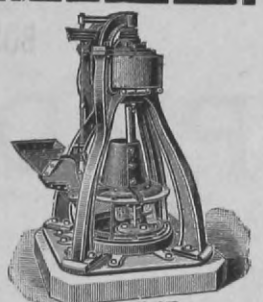
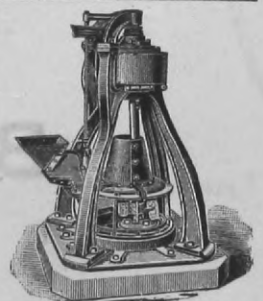
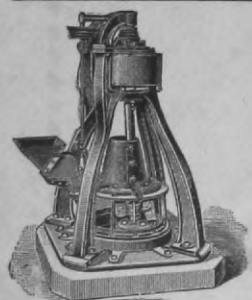
MILL.

OF ALL REFRACTORY SUBSTANCES.

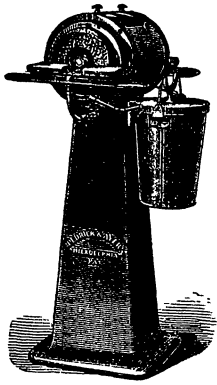
Will work either Wet or Dry. Capacity from 2 to 4 tons per hour, to 60 mesh or finer. Descriptive circulars and full information furnished on application to

BRADLEY FERTILIZER CO., 92 State Street, Boston.

Please mention THE IRON AGE in correspondence.



WINGS' PATENT CENTRIFUGAL GRINDING MACHINES.



HORIZONTAL DOUBLE GRINDER.

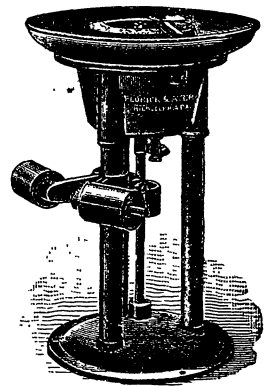
This machine is adapted to machinists' tool grinding and carries two grinding wheels, one at each end of arbor.

The water is carried to wheels from tank by head force, and back again into tank by centrifugal force, keeping a continuous circulation as long as enough water is kept in tank to cover supply pipes.

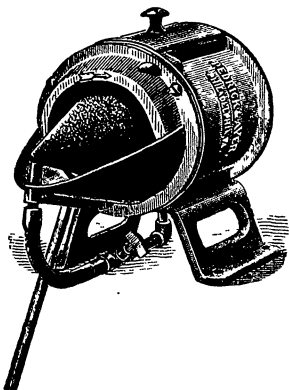
UPRIGHT GRINDER.

On this machine the water is brought on to and carried over the surface of wheel and back to tank again by centrifugal force alone and so continuously as long as water is kept in tank.

The grinding face of wheel is slightly beveled to accommodate the grinding of long knives which have to lay across the wheel from one side to the other. It is designed for grinding all kinds of wood-working tools having straight edges like planes, chisels, knives, etc., and is also effective for grinding machinists' and kindred tools.



GOUGE AND CUTTER GRINDER.



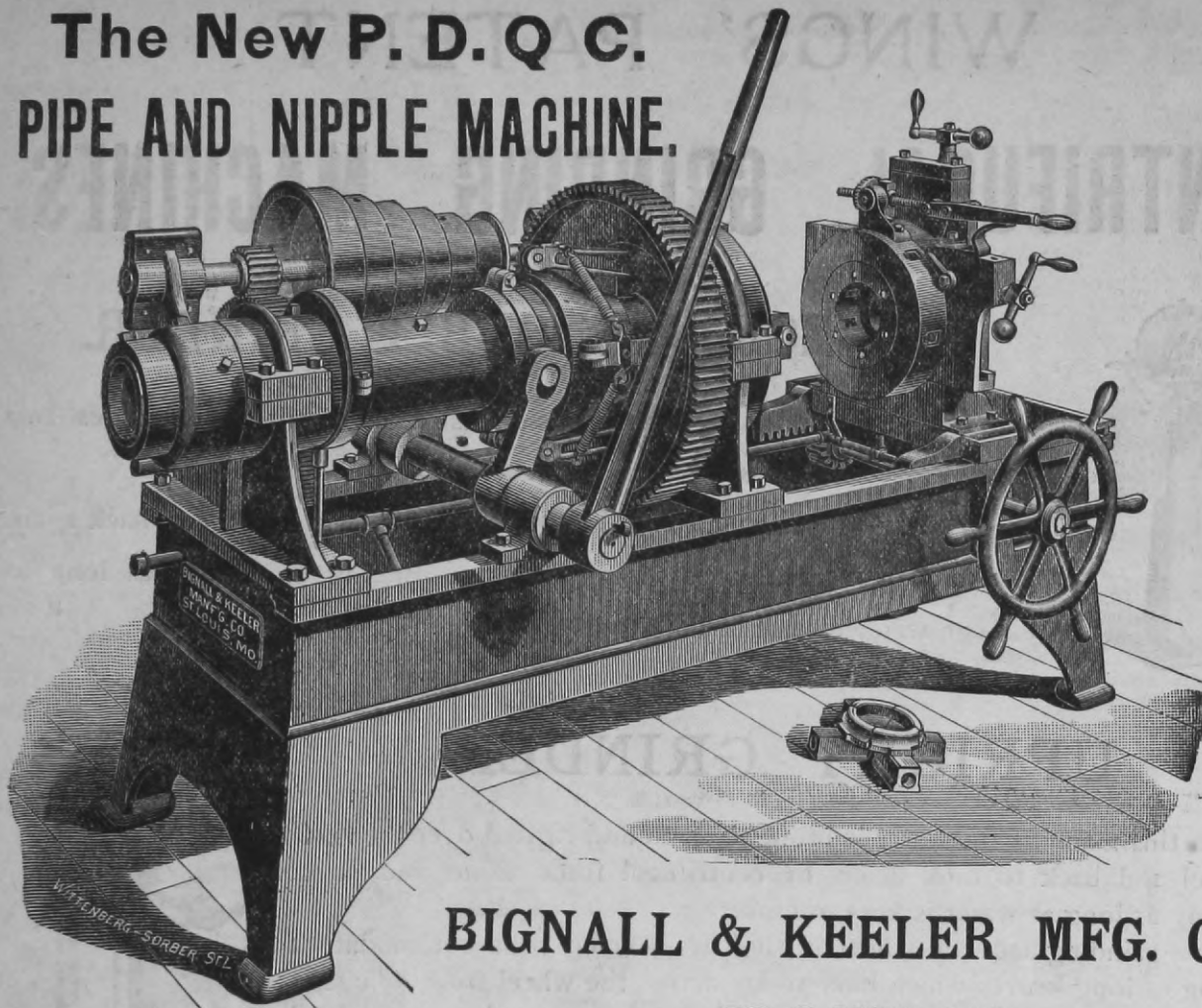
This little machine is designed for grinding inside gouges, cutters and tools having concave cutting edges, and will grind all such tools to a true arc of a circle within its limits. It will be found more serviceable and effective than a whole gang of wheels mounted in the ordinary way. It supplies itself continuously with an abundant amount of water in the same manner as the Horizontal Double Grinder. This machine is made either single or double, as desired.

The above machines possess all the virtue of the emery wheel for rapid cutting and accurate work, and **WITHOUT DRAW-ING OF TEMPER.** They are guaranteed in every particular. Circulars and prices on application.

PEDRICK & AYER,

1001 and 1003 Hamilton St., Philadelphia, Pa.

The New P. D. Q. C. PIPE AND NIPPLE MACHINE.



Send for description and prices. Capacity unequaled. Mechanism equal to that in the finest machine tools. All gears machine cut. All parts made on duplicate plan. Prices very low.

BIGNALL & KEELER MFG. CO.,

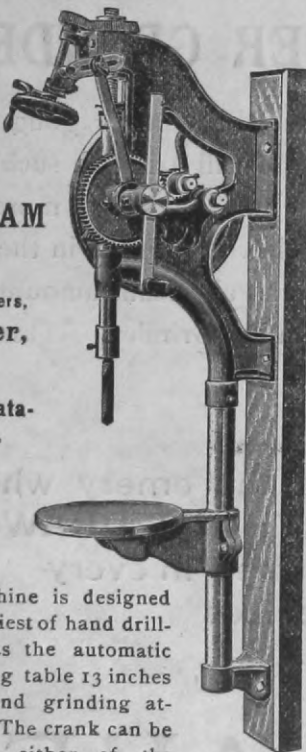
ST. LOUIS, MO.

No. 4 UPRIGHT DRILL. Triple Geared.

**GEO.
BURNHAM
& CO.**

Manufacturers,
Worcester,
Mass.

Send for Catalogue E.



This machine is designed for the heaviest of hand drilling. It has the automatic feed, a swing table 13 inches diameter, and grinding attachment. The crank can be changed to either of the two shafts, and the gearing can be used or not, at the option of the operator.

Length, - - - 71 inches.

Weight, - - - 250 lbs.

One of the Largest lines of Drills in the market.

G. A. Crosby & Co.,

176 and 178 So. Clinton St.
CHICAGO, ILL., U. S. A.

MANUFACTURE

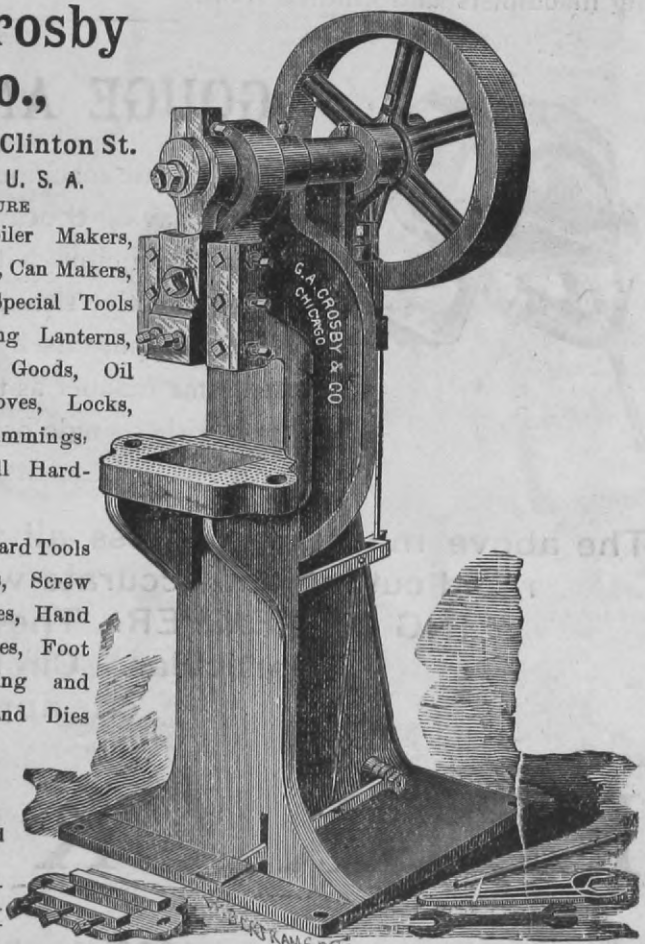
Machinery for Boiler Makers,
Sheet Metal Workers, Can Makers,
Soap Makers and Special Tools
to order for making Lanterns,
Bird Cages, Wire Goods, Oil
Stoves, Vapor Stoves, Locks,
Hinges, Trunk Trimmings,
Brass Goods and all Hard-
ware Novelties.

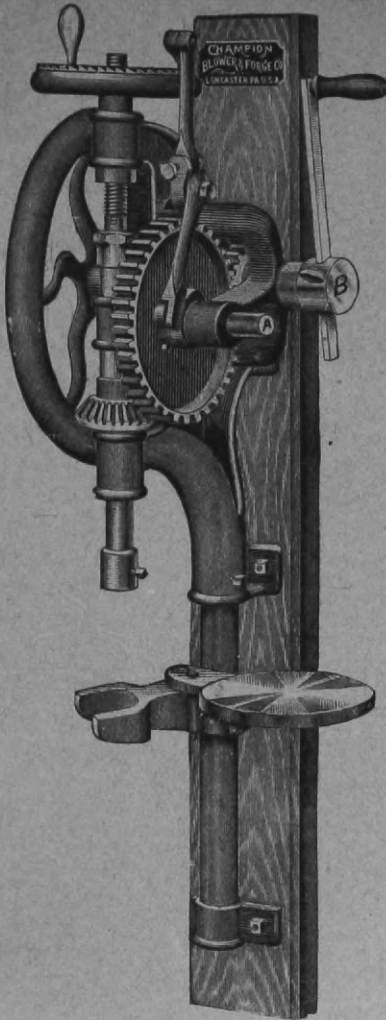
Among their Standard Tools
are Power Presses, Screw
Presses, Foot Presses, Hand
Presses, Drop Presses, Foot
and Power Squaring and
Trimming Shears and Dies
of every description.

Write for Prices.

**Work Guaranteed
the Best.**

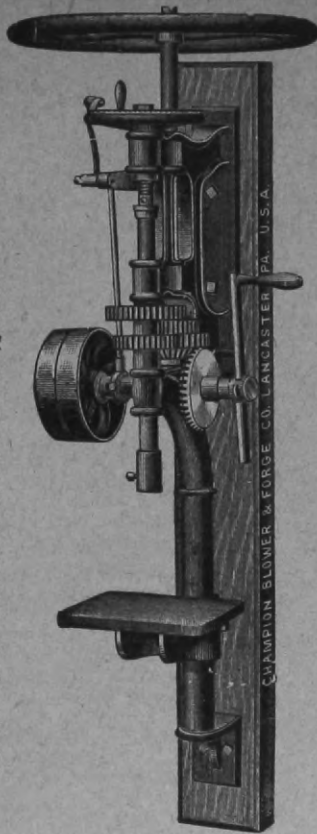
Agents for the Clark Per-
fection Kerosene Oil System,
for heating soldering appa-
ratus.





No. 4 UPRIGHT SELF FEED DRILL.

Weight 155 Pounds.
Drills to centre of 18 inch circle and from 0 to 1 1/4 inch hole.



No. 7 UPRIGHT SELF FEED DRILL.

Made only with Cut Gear. Weight 250 pounds.
Drills to centre of a 19 inch circle and from 0 to 1 1/4 inch hole.



The Champion 1890 Steel Frame Lever Blower.
Guaranteed the King of all Blowers.

The 1890 is the only Double Geared Blower made. It will produce one-third more blast with 20 strokes per minute than any other Lever Blower will produce with 30 strokes per minute, a labor saving of 600 strokes per hour, or 6000 strokes per day of 10 hours' steady work.

THE WORLD'S CHAMPION NEW UPRIGHT \$10.00 SELF-FEED 1891 PATTERN POST-DRILL.

Already over 30,000 of these famous \$10.00 post drills in use in the United States. The best testimonial of its superior merits we can possibly furnish, is to have you ask your neighbor brother blacksmith who is using one. Its weight is 120 lbs. Two True and Honest Speeds on the right hand side of the drill and a bearing on both sides of all the gears precisely like all drills costing two and three times the money. Drills to centre of 14 1/2 inch circle and from 0 to 1 1/4 inch hole.

THE NO. 4 CHAMPION LEVER BLOWER in wood frame and 4 1/2 inch iron frame are now made with 16 inch fan only.

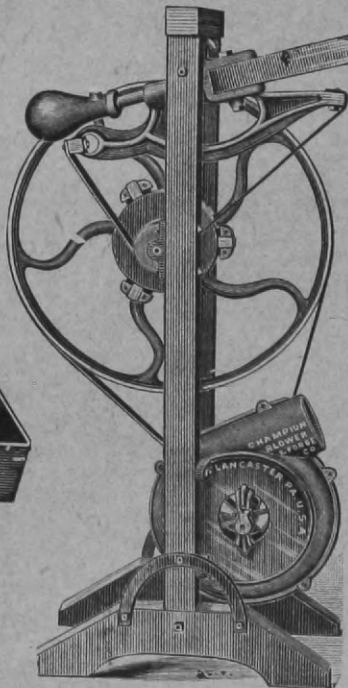
Champion Blacksmiths' Lever Forge.

The largest Blacksmith Forge made. Fan, 16 inches; Hearth, 32 x 45 inches.

SPECIAL NOTICE.

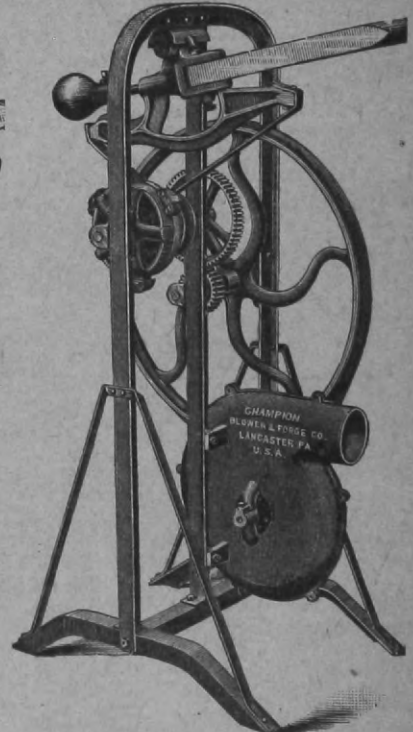
Our No. 1 Lever Blacksmith Forge is the only forge made with "a 16-inch fan;" also with a patent sloped bottom coal box which is patterned precisely after the old styled brick or stone hearth. This is the only forge made with the above conveniences.

Forge No. 1.
Made only in Half Hood.



THE CHAMPION TIRE SHRINKER. Will shrink from the smallest to 1 x 4 inch tire.

PATENT APPLIED FOR.

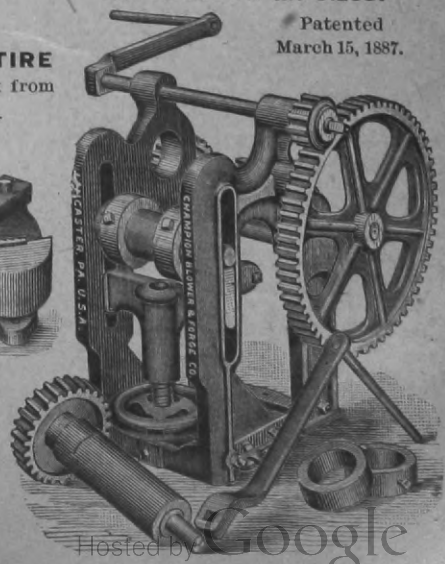


The Patent Giant Tire Bender. Made in all sizes.

Patented
March 15, 1887.



The Eureka Tire Bender.
Patented March 15, 1887.
Will bend from smallest to 1 x 6 inch tire.



Write for Catalogue illustrating 125 different styles of Blowers, Forges, Drills, Screw Plates, Tire Benders, Shrinkers, Etc.

CHAMPION BLOWER & FORCE COMPANY,
LANCASTER, PA., U. S. A.

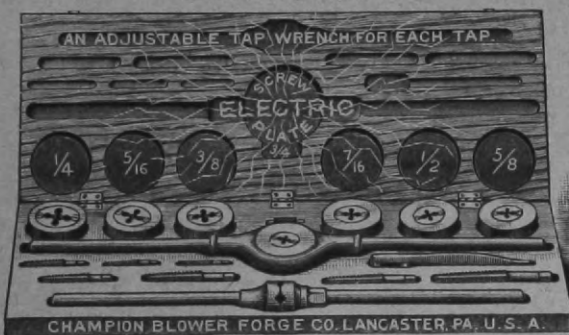
THE CHAMPION ELECTRIC FULL MOUNTED SCREW PLATES,



in which every die is supplied with a stock complete in itself; thus being able to use different dies at the same time from same set. By having a stock with each die, the stock is made in proportion to the cutting size of the die; making it in all respects the handiest, the quickest working and most perfect tool ever made. Every set supplied with our Patented Adjustable Electric Tap Wrench.

THE CHAMPION ELECTRIC SCREW PLATE.

Every Set Supplied with our Patented Adjustable Electric Tap Wrench.



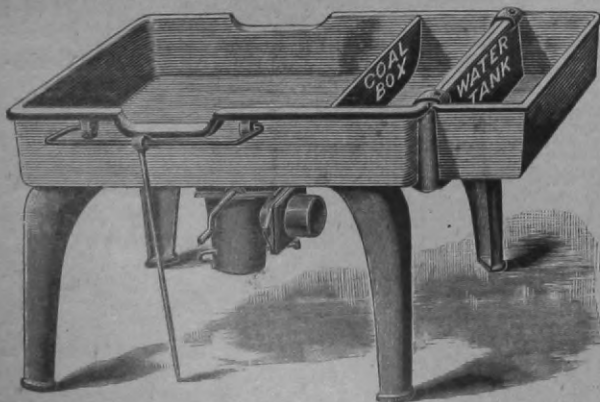
THE "EASY" SCREW PLATE.

The Easy Screw Plate is a first-class tool, sold for a remarkably low price for reasons of its simpleness in manufacturing.



THE CHAMPION PATENTED ELECTRIC ADJUSTABLE TAP WRENCH.

The above cut illustrates our New Adjustable Tap Wrench, which we believe to be a perfect tool and long felt want by mechanics. It will be seen by illustration that the wrench is built "Hub" Shape "Round." The adjustable squares or sockets to hold the taps in wrench are made to fit all sizes of taps. This wrench not only holds all sizes of taps solid and firm, but the taps always remain in the centre of the wrench, consequently never becoming top heavy or side heavy, as is the case with all other wrenches which take in different sizes of tapes with the same socket.



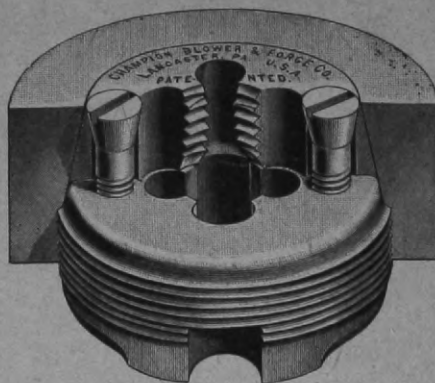
THE CHAMPION STATIONARY BLAST FORGE.

ALL GOODS WARRANTED STRICTLY FIRST CLASS.

Write for Catalogue illustrating 125 different styles of Blowers, Forges, Blacksmith Drills, Screw Plates, Tire Benders, Tire Shrinkers, &c., &c.

Champion Blower & Forge Co., - Lancaster, Pa., U. S. A.

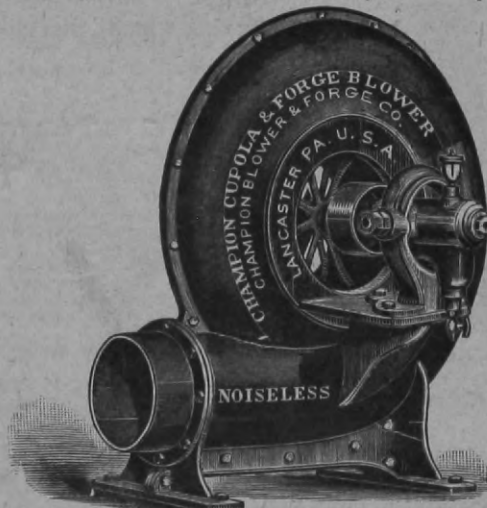
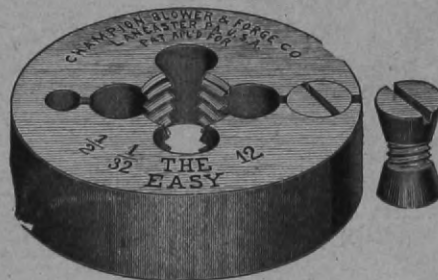
THE CHAMPION ELECTRIC DIE AND COLLET.



The cut above represents our new "Electric" Die and Collet in parts, showing one-half of the Die in its proper position and the collet cut in half, with a full view of the guide, thus showing Perfection in the mechanism of screw plates. The greatest points of superiority are as follows: 1st. The adjustment is entirely universal, impossible to make one cutter cut more than another, thus absolutely always cutting a perfect thread. 2d. The adjustment of our Die and Collet can be varied from $\frac{1}{1000}$ to $\frac{1}{16}$ th of an inch to meet the variations of wrought iron, or to allow nuts and bolts to be made to fit together tightly and loosely, as may be desired, by simply setting the taper screws to size wanted, and then placing the wrench in the notches purposely made for this in guide, and with one simple turn the Die is universally sent home, where it is placed as solid and firm as though made from one piece of steel. 3d. As our Dies are absolutely firm by being held to the guide by the taper of the Die and Collet, and also the two taper screws, making it entirely impossible for cuttings or any waste material to get underneath the dies to cock them up and strip the threads, which is a serious point commonly known in other screw plates. The Full Mounted Electric Stock and Die is constructed precisely in adjustment of dies like illustration and explanation given above.

THE EASY DIE.

Showing the Tap Head with Taper Nut Adjusting Screw.



THE CHAMPION STEEL PRESSURE BLOWER.

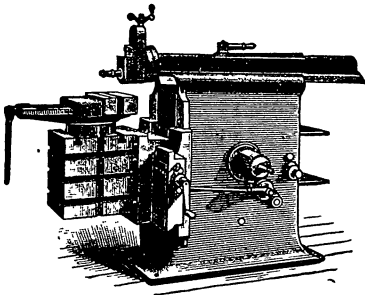
For Cupola Forges and Furnaces.

LINK-BELT

ENGINEERING CO
NICETOWN.
PHILA.
49 DEY ST.
NEW YORK,

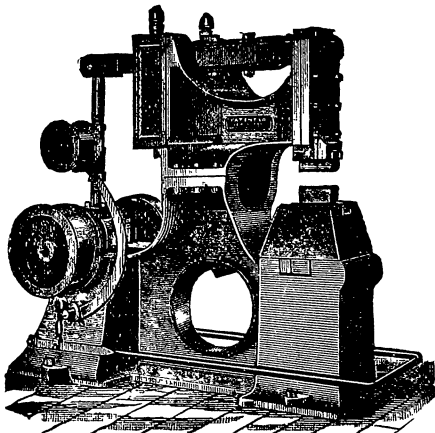
Elevators, Conveyors, Manila Rope Power Transmission Machinery, Ewart Detachable Link Belting
Dodge Chain, Howe Chain, &c. Western connection.

LINK BELT MACHINERY CO., - - - CHICAGO, ILL.



The Henderson Machine Tool Co.
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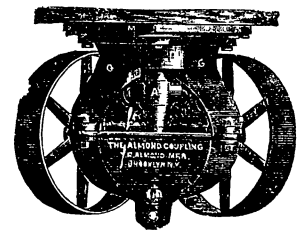
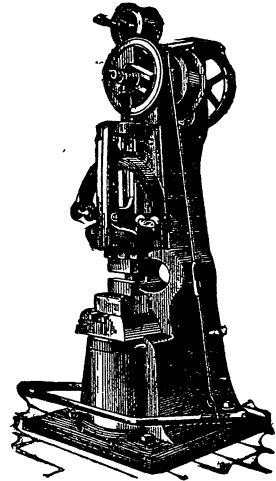
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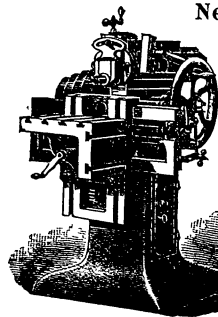
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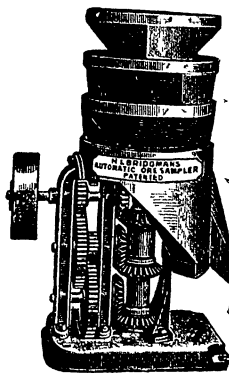


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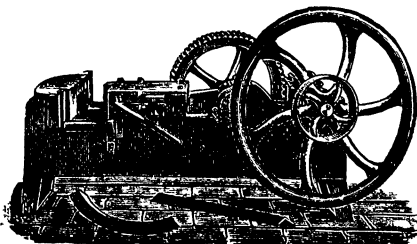
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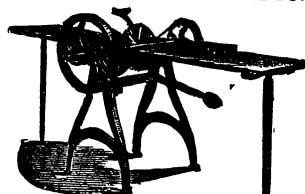
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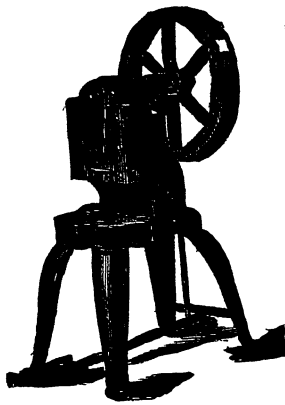


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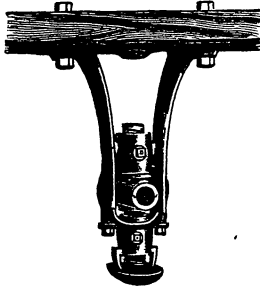
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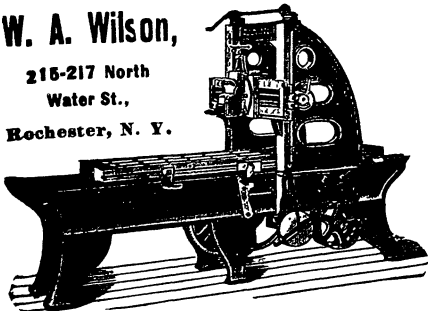


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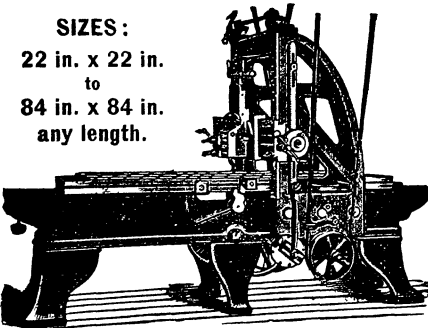


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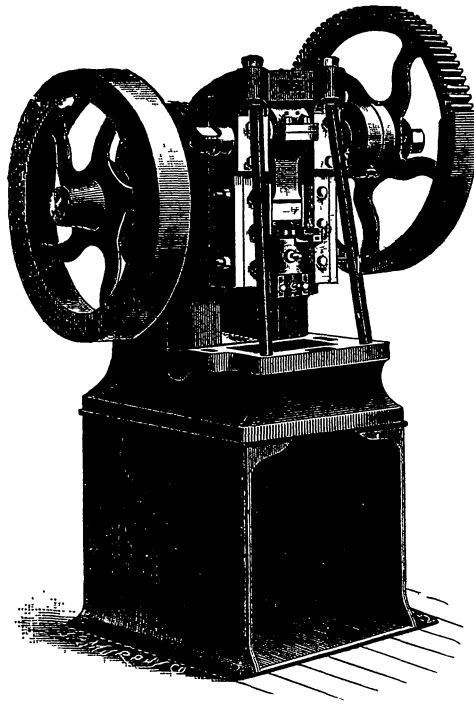
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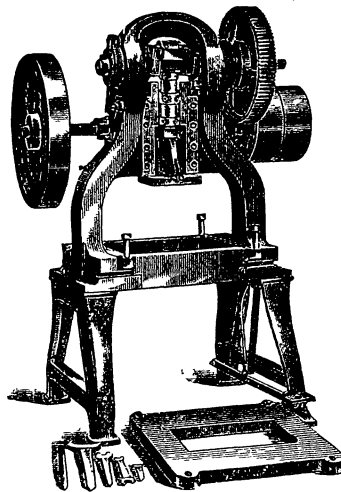
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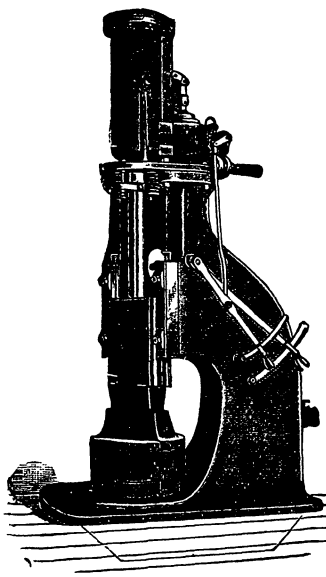


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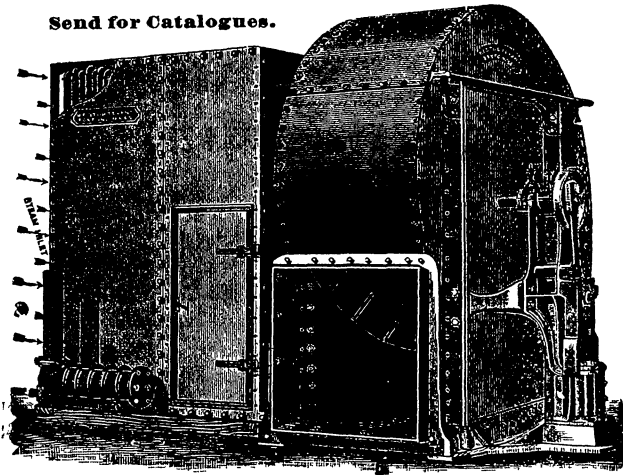
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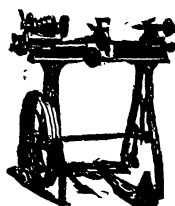
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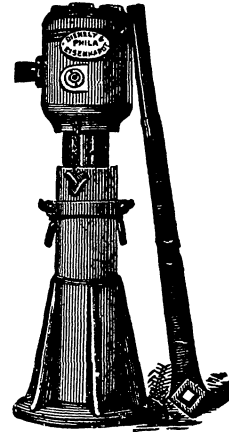
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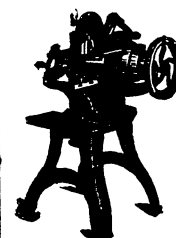
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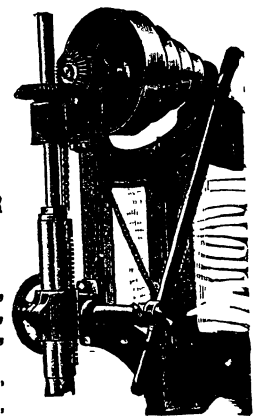
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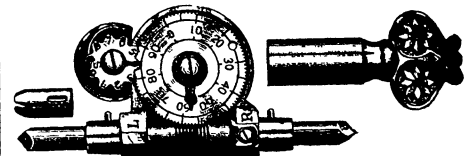
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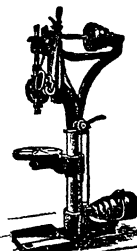
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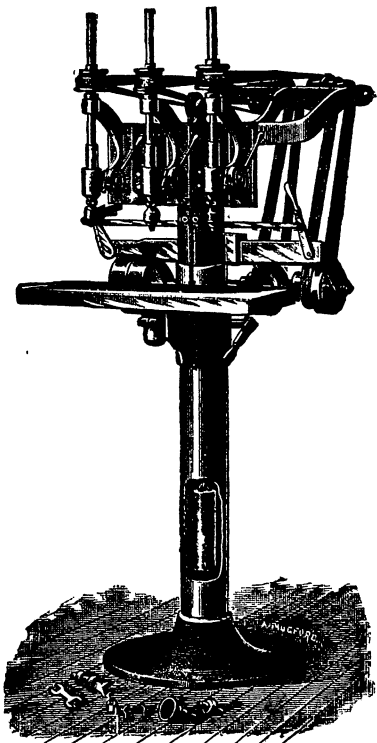
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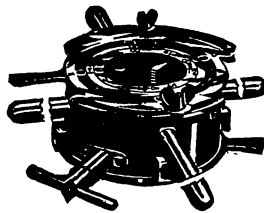
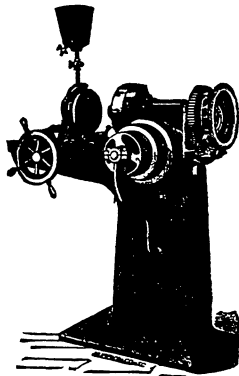
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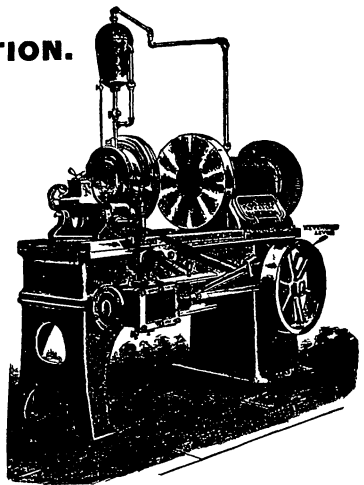
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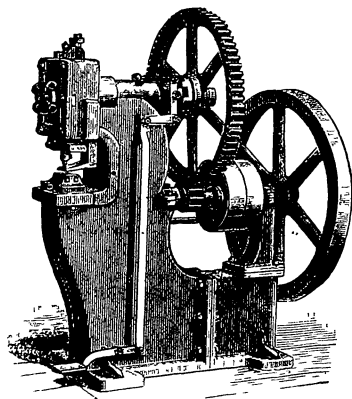


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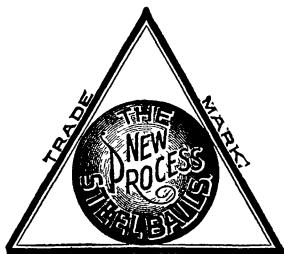
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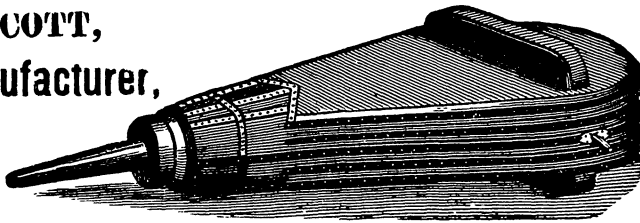
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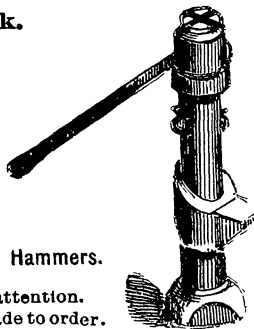
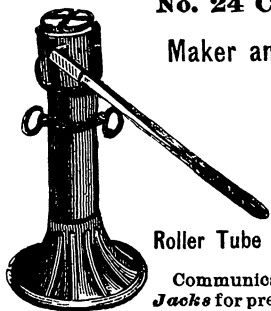
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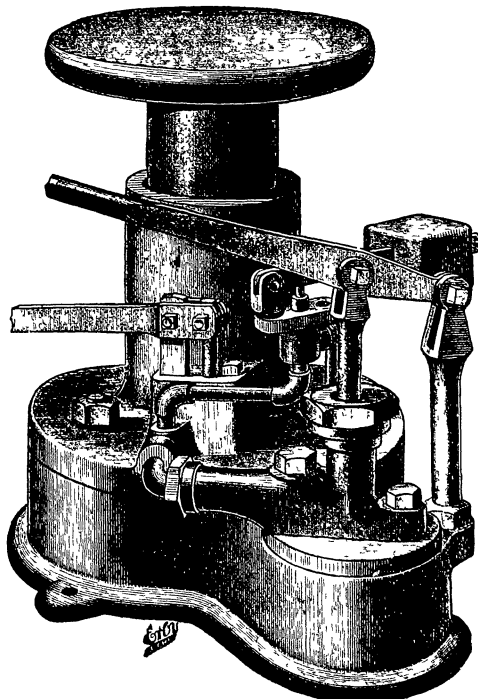
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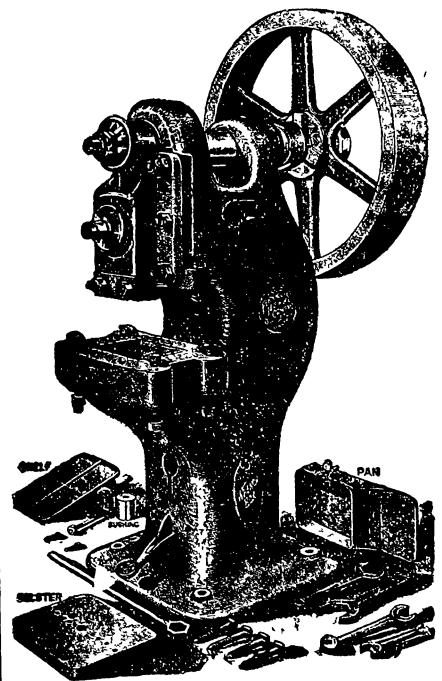
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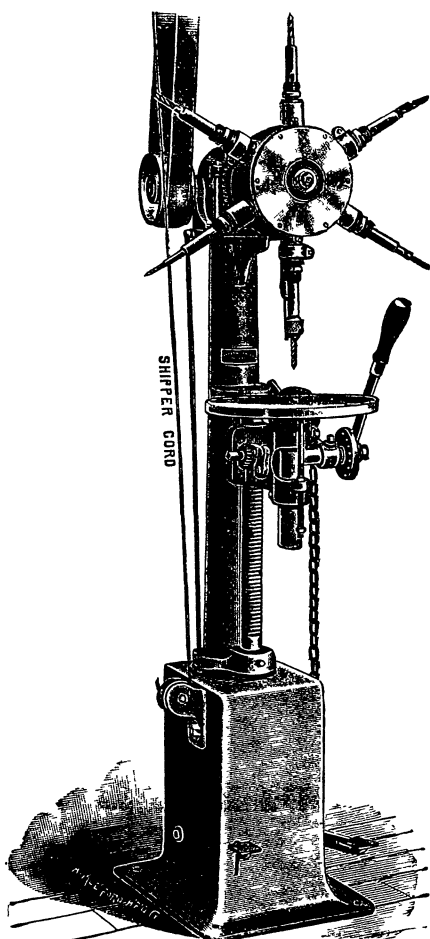
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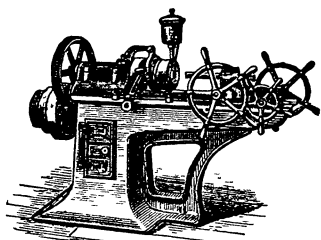
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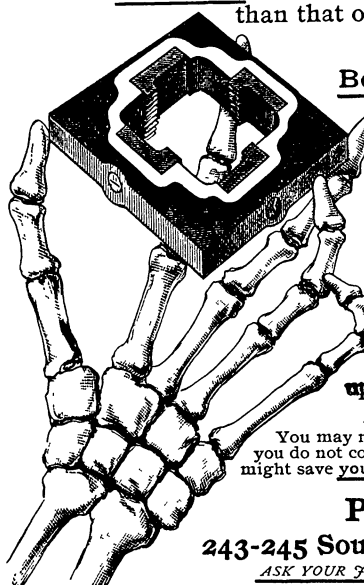
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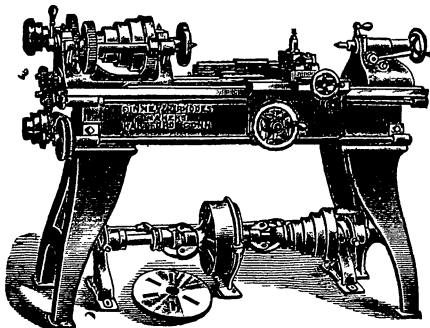
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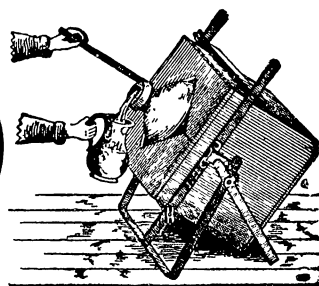
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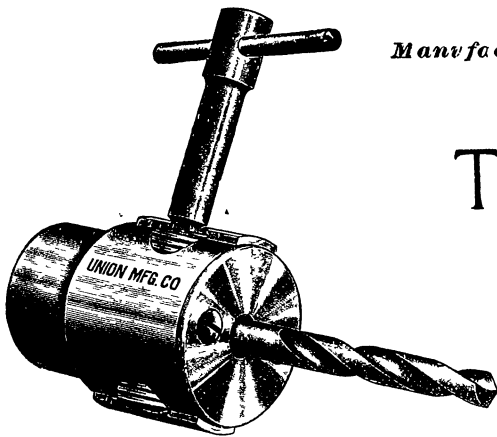
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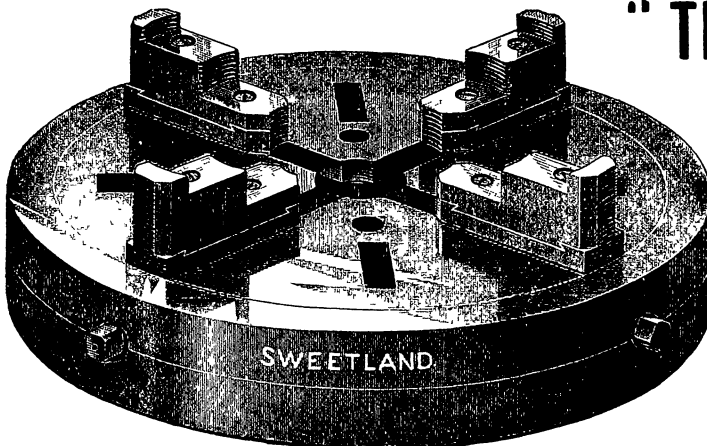
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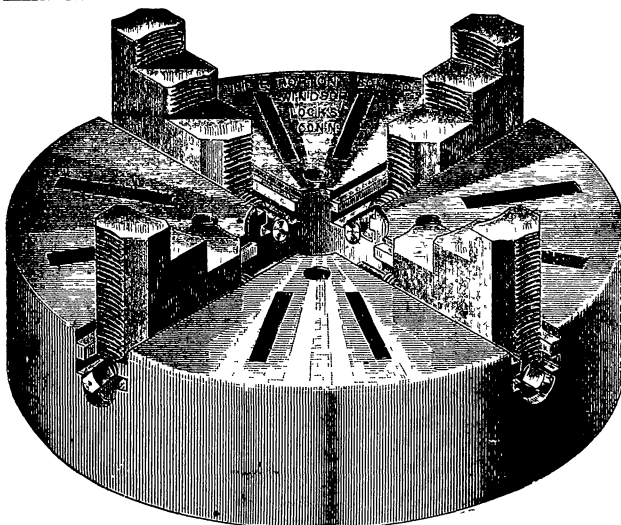
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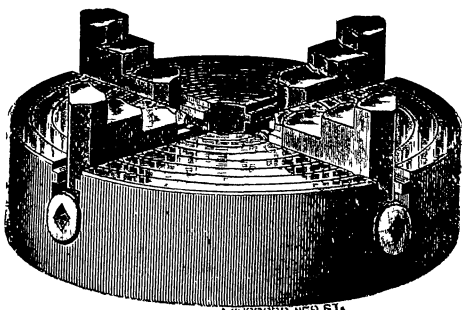


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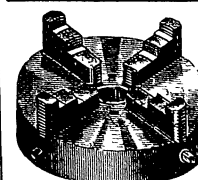
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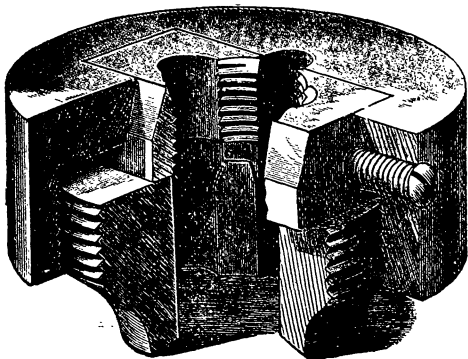


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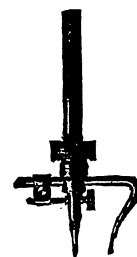
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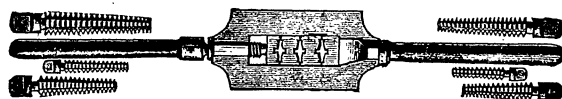
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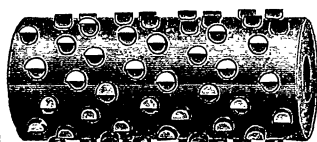
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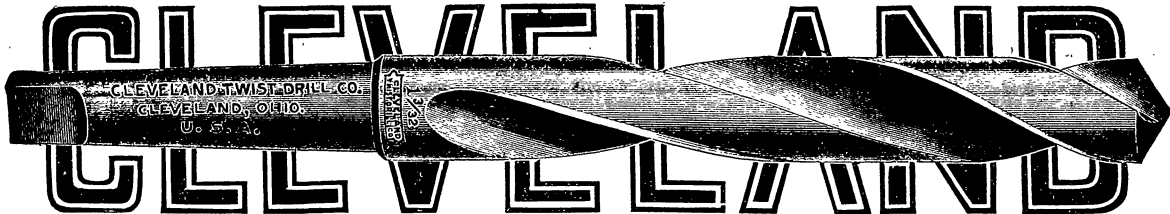
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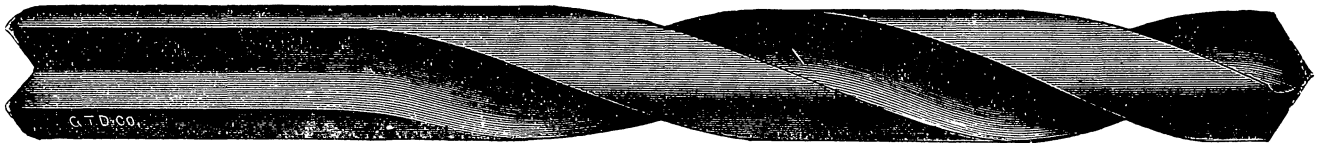
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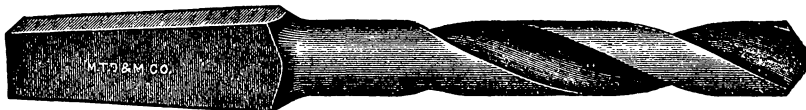
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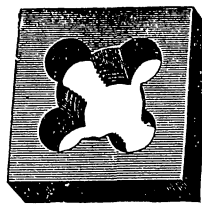
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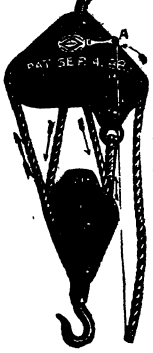
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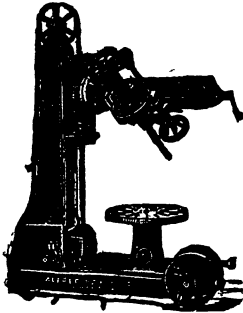
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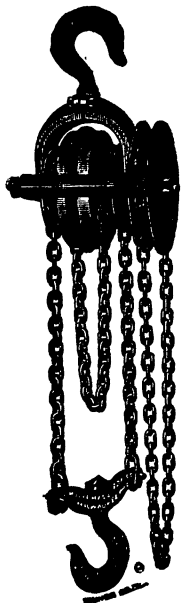
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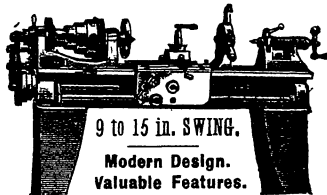
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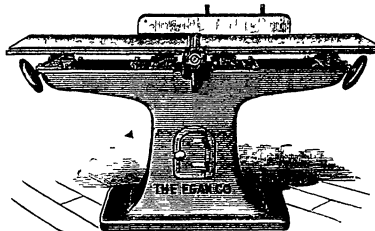
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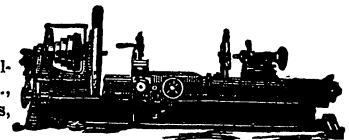
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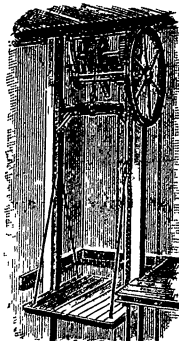
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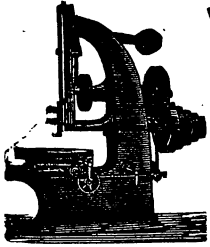
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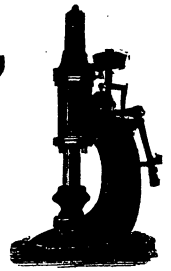
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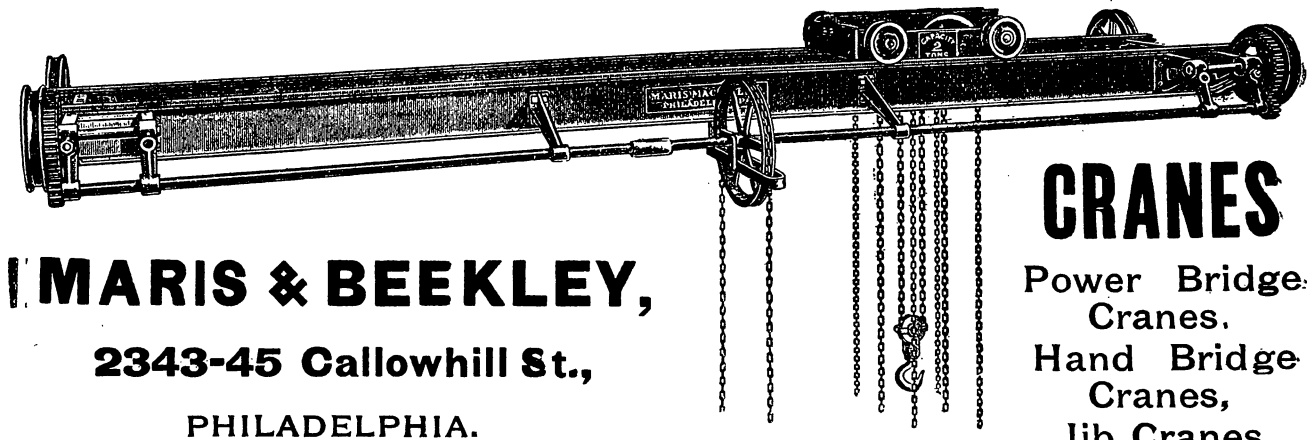
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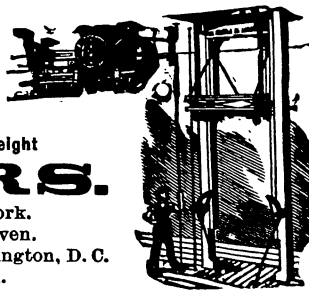
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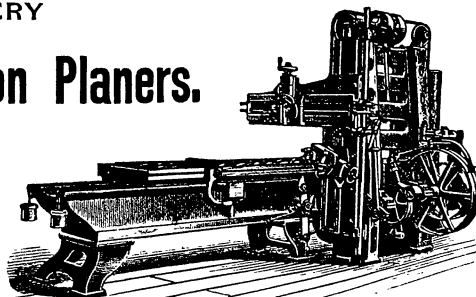
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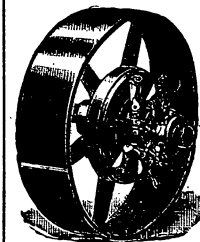
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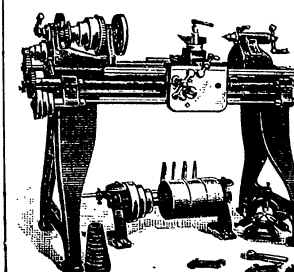
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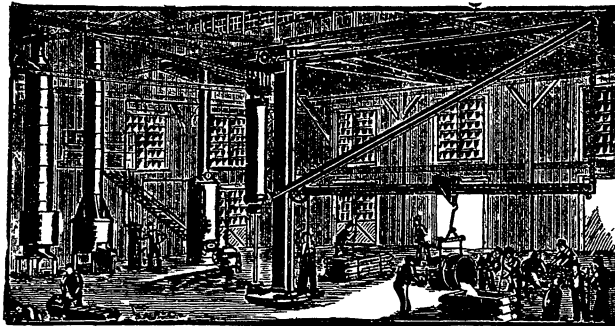
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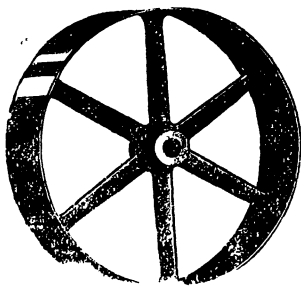
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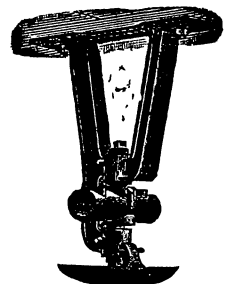
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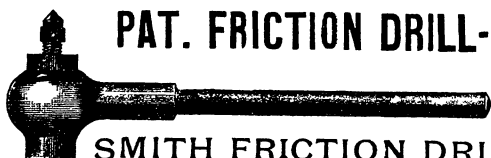
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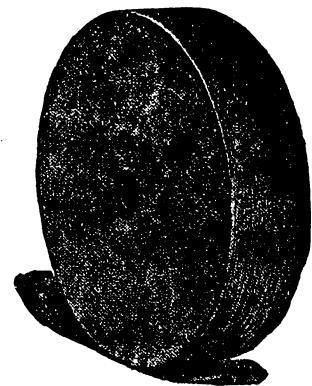
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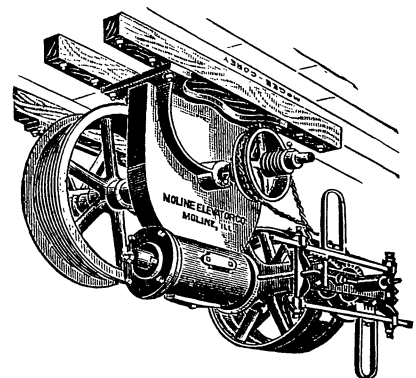
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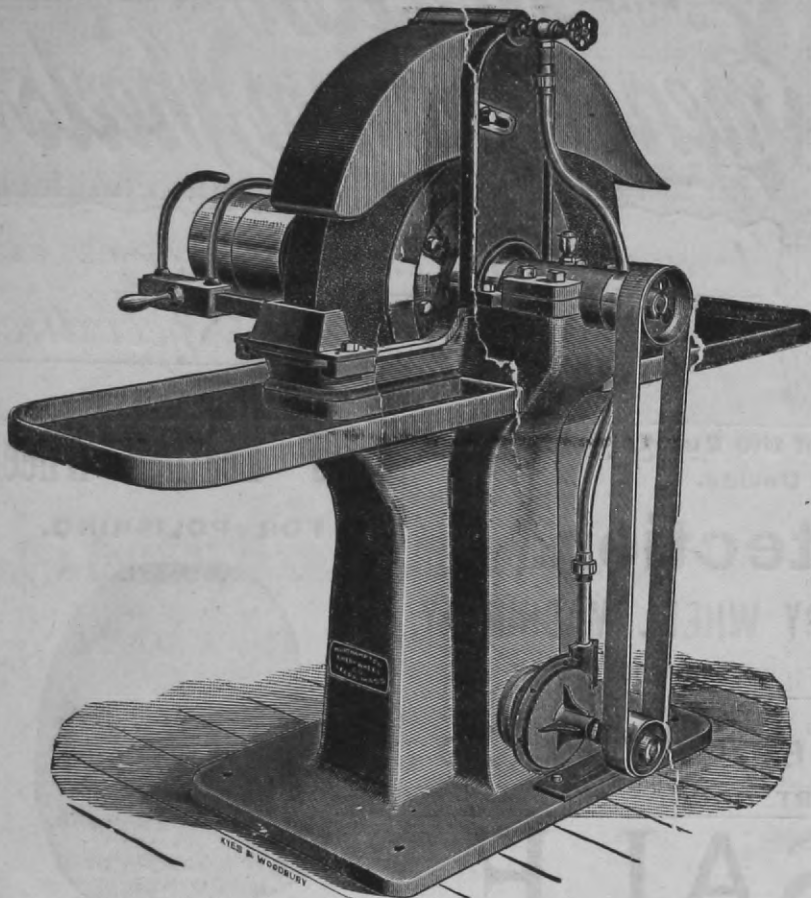
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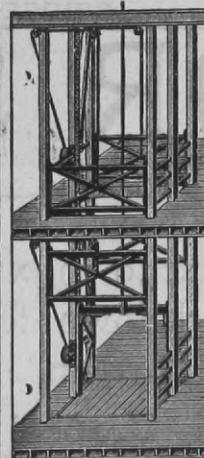
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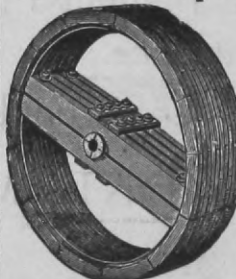
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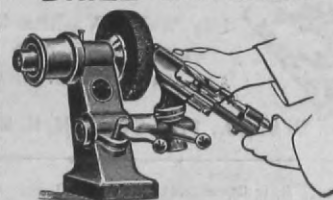
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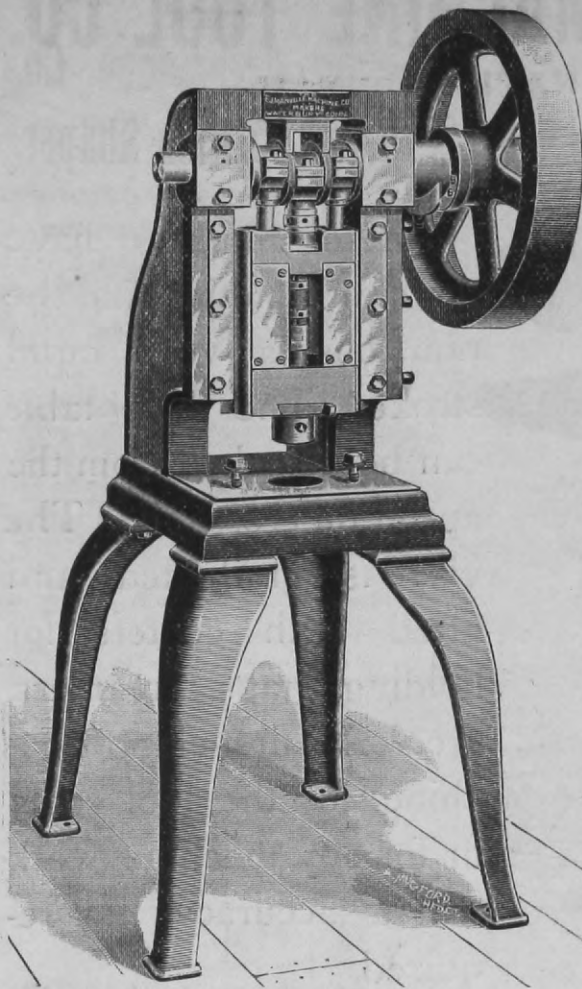
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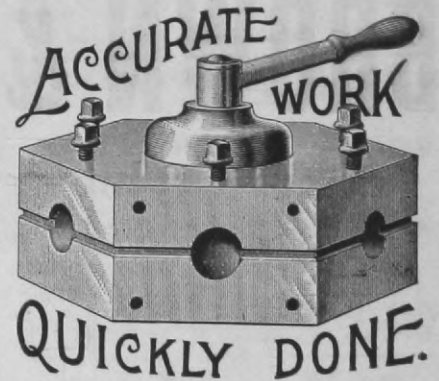
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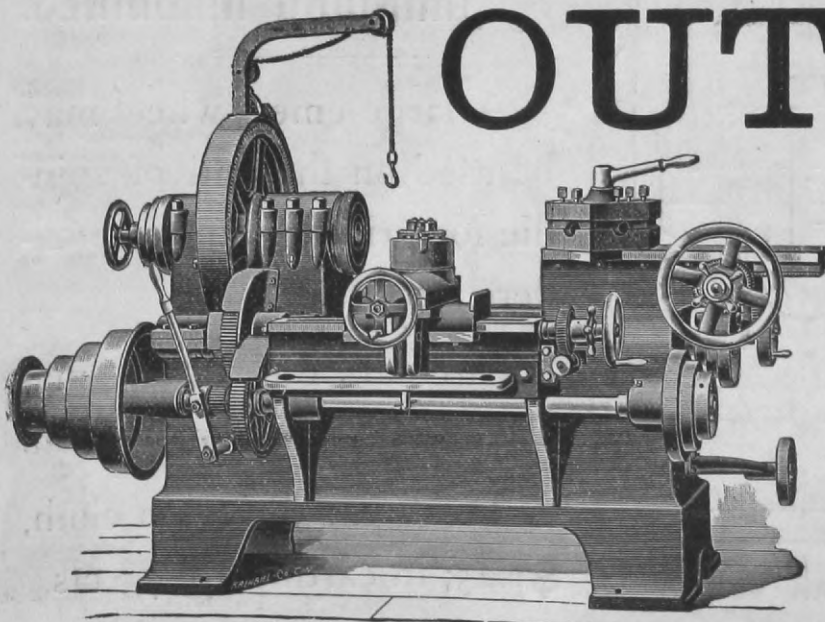
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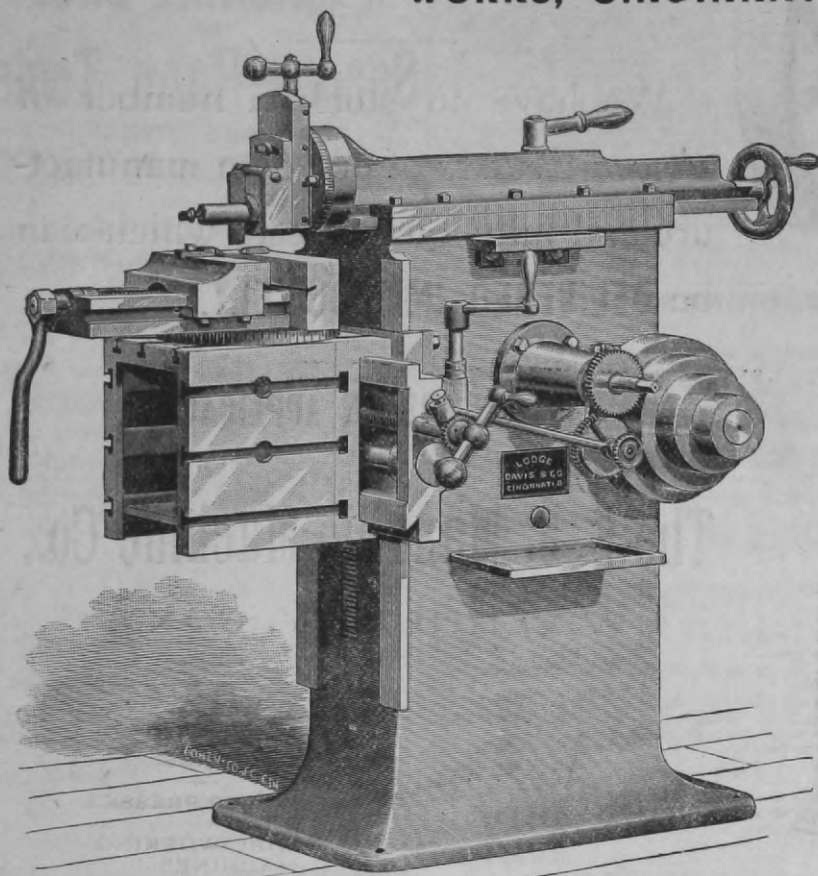
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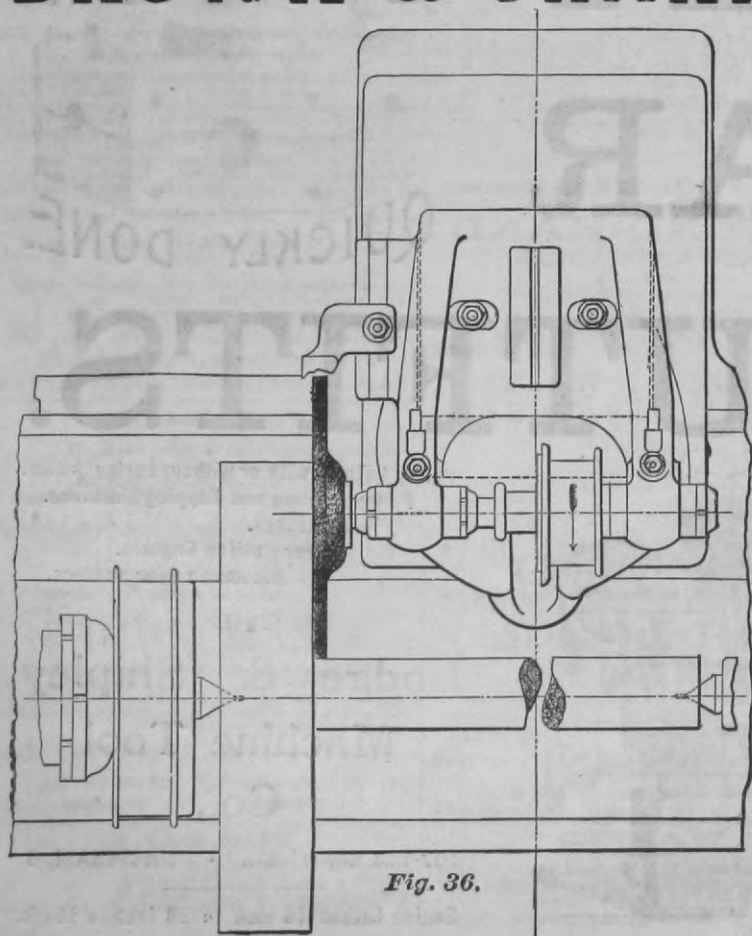


Fig. 36.

A large emery wheel may be used on the end of spindle for grinding up to shoulders, collars, etc.

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One 12 in. stroke Slotting Machine.

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East Chicago, Ind., on the Belt R. R. (with several trunk lines); track on the premises main building, 90 x 180 feet; annex, 28 x 90; engine room, 24 x 26; melting room, 22 x 43; machine shop, 50 x 50 feet; 6 swinging cranes; elevated track for handling heavy machinery; Sturtevant blasting fans; 2-story office, 14 x 16 feet. Buildings new and thoroughly constructed of iron and brick. Ten acres of land, with railroad tracks on land and new canal across one end, giving water connection to Lake Michigan and Calumet River.

East Chicago has sewers, water, gas, electric light, new opera house and is growing fast.

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A new or second-hand portable rolling mill Scale, with or without trucks; must be strong and in A1 condition, guaranteed to weigh accurately, with a capacity of 4 or 5 tons. Address, with lowest cash price, giving full description and particulars, "ROLLING MILL SCALE," office of *The Iron Age*, 96-102 Reade St., N. Y.

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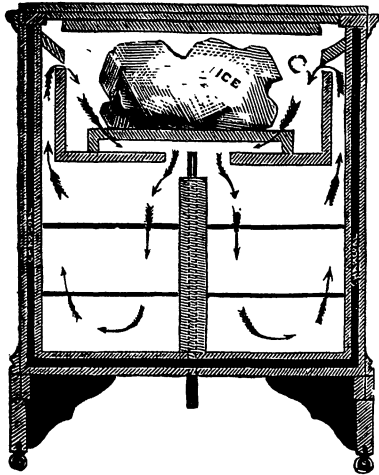
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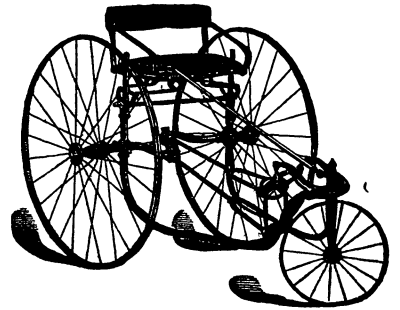
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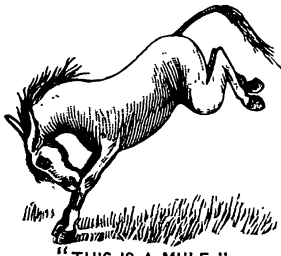
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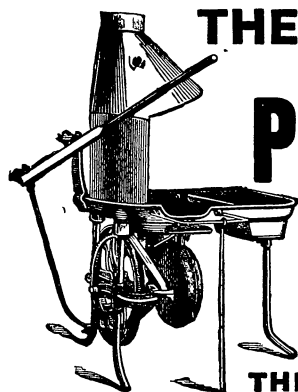
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Builders of Rolling Mill Machinery. Special Machines for finishing and making goods from Sheet Brass, Copper, Steel, Silver, &c.; **POWER PRESSES, HYDRAULIC PRESSES, Drop Presses, Foot Presses, RIVET MACHINES, Gang Slitters, Grinding Machines, Steel Rolls, Wire Mill Machinery, Tube Drawing Machinery, Dies, &c.**

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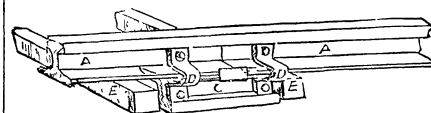
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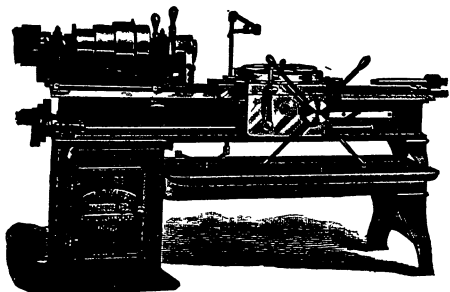
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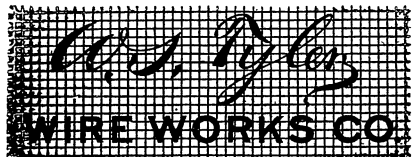
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2 BY 24 FLAT TURRET LATHE.



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Assays of Ores, Metals and Metallurgical Products of every description.
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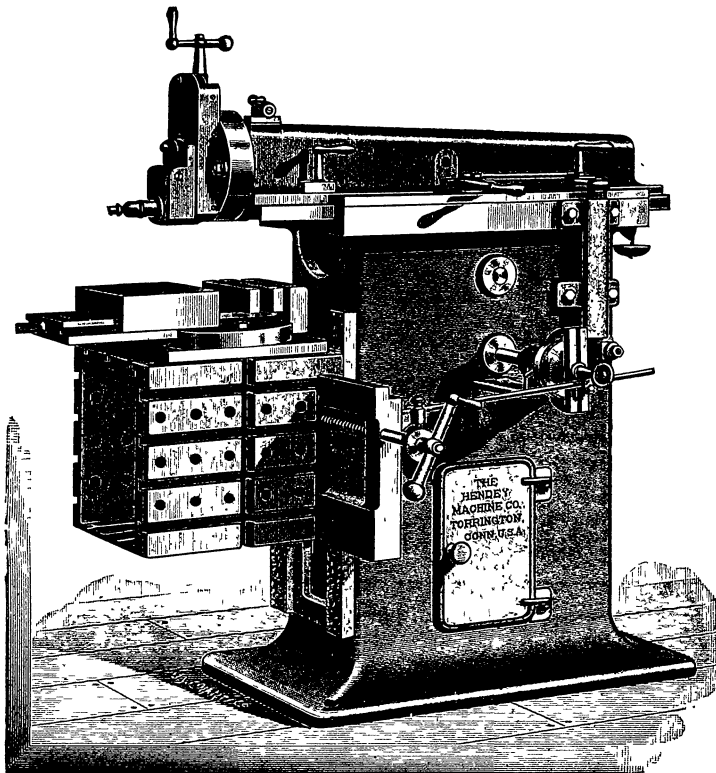
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IS A SPECIAL TOOL FOR THIS PURPOSE.

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AUSABLE HORSE NAILS.

THE ORIGINAL

HOT FORGED and HAMMER POINTED.

By JUDICIAL DECISION.

Extracts of Judge Coxe's opinion. January, 1893.

"The defendant has advertised its nails upon their own merits, believing them to be the best nails manufactured. There has been no deception, no concealment, no false pretences. These nails have entered the market as the **Ausable Nails** and what reputation they have gained has been *under their own name and upon their own merits.*"

HOT FORGED AND HAMMER POINTED NAILS
"were made by the defendant (Ausable) before they were made by the complainant."

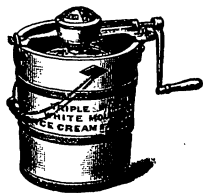
"The defendant used the words 'hammer pointed' long before the complainant used them and has so used these words to describe its nails continuously since 1872"

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White Mountain Freezers.

KNOWN AND APPRECIATED THE WORLD OVER.

RESULT:—The Largest Sale of any Freezer on the market.

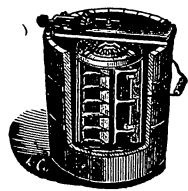


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THE OLD RELIABLE STANDARD FREEZER

has the reputation of being the BEST ICE CREAM FREEZER ever introduced. STRENGTH, DURABILITY, NEATNESS AND EFFICIENCY are prominent points in the manufacture. Full Size Can, CEDAR TUB, Detachable Hinged Crossbar, Self-adjusting Vibratory Scraper, etc.

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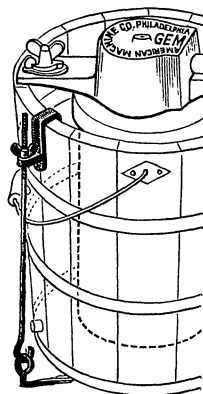
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GEM
FREEZER
CLAMPS,

To hold
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Made in
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sizes to
suit any
Freezer.

LIST PRICE
\$3.00 per
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For shaving ice from block in refrigerator for cooling water, wines, fruits, oysters, &c., and use at Soda Fountains, Restaurants, and Bar Rooms.

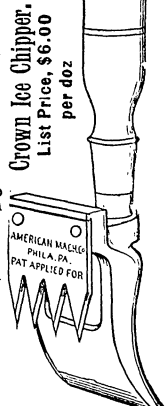
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To chip
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Will re-
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lb. block
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We are
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In the U. S. We manufacture, import, and job the most complete line in America, including some 30 styles of new wheels, at unheard of prices. Our superior inducements bring us orders from every State, Territory and large city in the U. S., Canada and Mexico, also ship to Brazil and England. It will pay you to write to us. Prompt shipments guaranteed. Catalogue free. ROUSE, HAZARD & CO., 146 G St., Peoria, Ill.



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See Page

You'll Buy me During '93

I'm the Columbia of the new year—as ever the bicycle of lightness, strength, beauty—only more so.

Most comprehensive cycling catalogue in the world, free at Columbia agencies, by mail for two two-cent stamps. Pope Mfg. Co. Boston, New York, Chicago.

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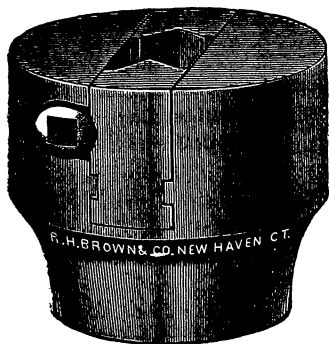
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THREE SIZES.

No. 0 takes any drill from 0 to 1-2 inch inclusive.

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They are the strongest and most durable made. Drill absolutely in the center. No twisting or bending necessary if drill is straight. Can be fitted to hollow spindle lathes for working long rods.

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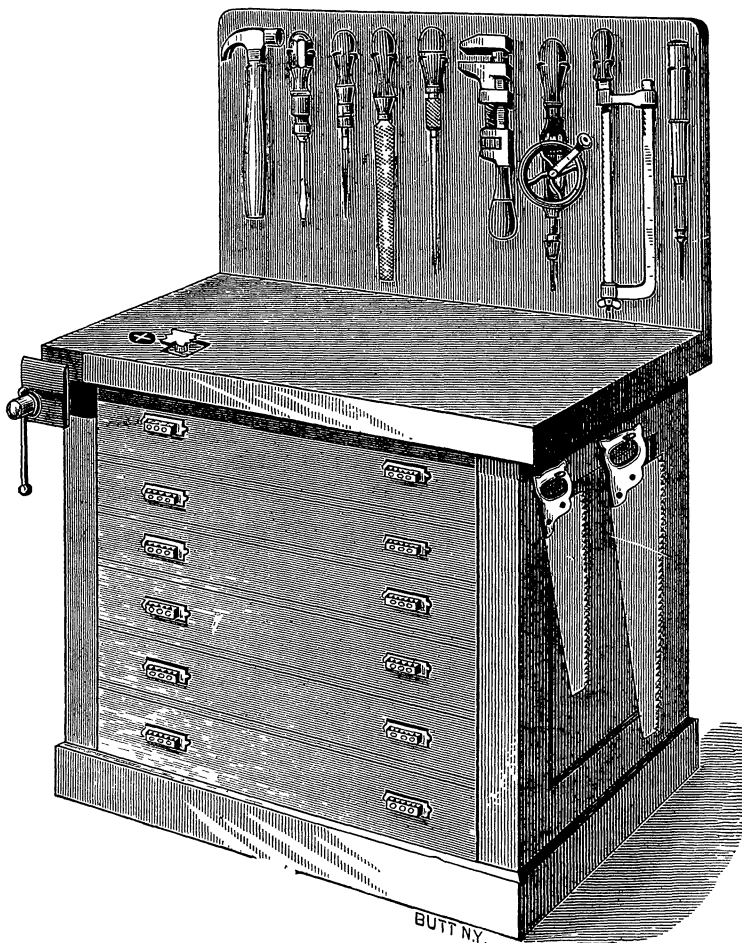
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Bench and Tool Chest combined; 34 x 36 x 18 in.; made of Ash; Price, \$20.

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Hand Screw Spindles made of strictly second growth Hickory—never anything else.

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All threads cut with a saw to leave the grain solid—a patent process.

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Ornamental Metal Work, Locks and Builders' Hardware for every purpose.

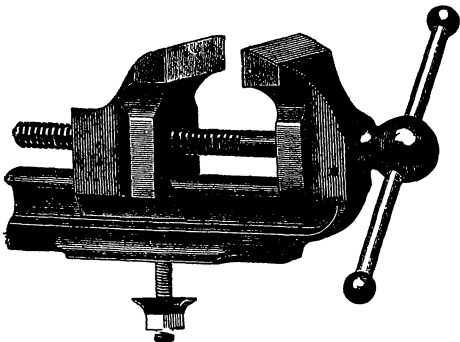
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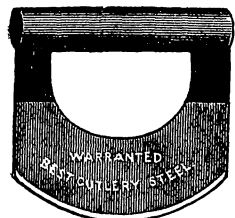
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IT PAYS. Nothing about a Hardware Store looks so well as clean shelves and the goods neatly boxed with a fresh sample on the front. Customers are attracted by such a display of care, and notice and buy things that would ordinarily go without notice. The Boxes are inexpensive, save the goods, make a big show for a small investment and help the salesman. Send to

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**THE GEM
SOLID STEEL MINCER**



Single
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Double Blades.

Handle and Blade Formed in one piece.
Always Clean. Indestructible.
No Rivets to Wear Loose.
No Wooden Handle to Shrink, Swell, Loosen,
Split, or Fill with Rancid Grease.

MANUFACTURED BY
PALMER HARDWARE MFG. CO.,
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THE DEALER who sells what
THE PEOPLE ask for.

MAKES FRIENDS and MONEY, and
SAVES TIME and TROUBLE.

The people ask for

**LePage's
Liquid
Glue,** And the people are right.

It is the strongest and best glue made. It has been imitated, but never equalled. Be sure to get what you order and ACCEPT NO SUBSTITUTES.

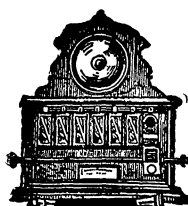
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RUSSIA CEMENT CO.,

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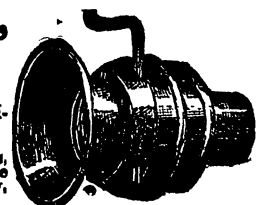
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Complete Outfits of Speaking Tubes, Whistles, Electric, Mechanical and Pneumatic Bells. A full line always in stock. Send for new catalogue. Factory, DeKalb ave., near Knickerbocker, Brooklyn, N. Y.



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WARNER'S BURGLAR PROOF LOCKS.

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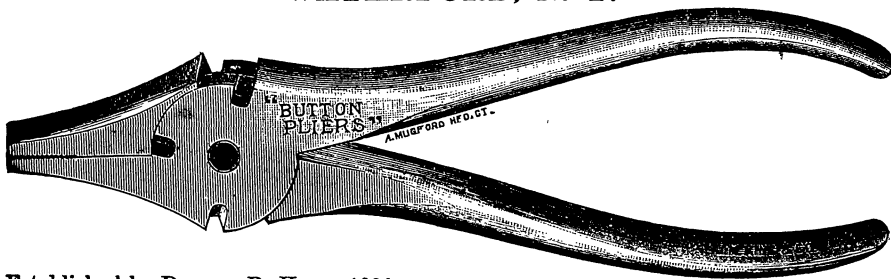
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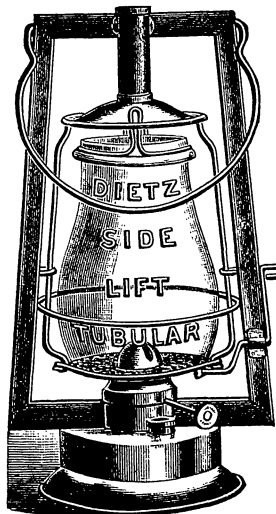


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Also Manufacturers of BLACKSMITHS' and
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TAPER TAPS, HAND, NUT and SCREW
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When you purchase a Lantern, Street Lamp
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"DIETZ" Make

is the best. Our goods have stood the test
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1788.INCORPORATED
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HARDWARE, CUTLERY, TOOLS

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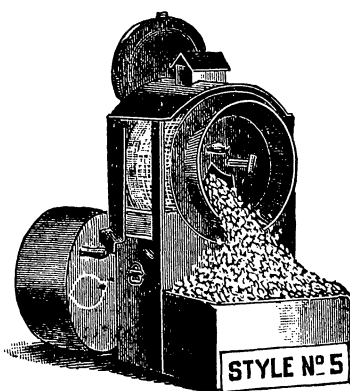
Refrigerator Door

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Have rapidly supplanted all
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Refrigerator Trimmings.

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12 years and upward; \$1.00 to \$50.00 profit per day.
1500 now in use.

Guaranteed to have no equal. Agents wanted.

Write for illustrated catalogue and prices on Pop
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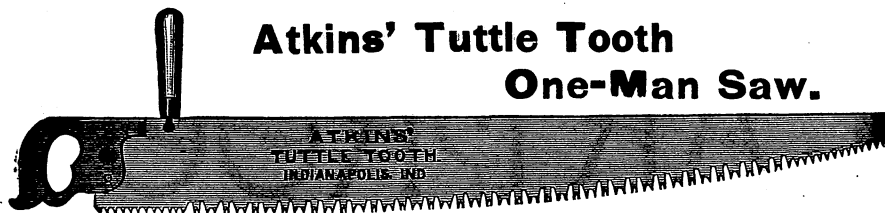
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218-220 E. Mo. Ave., - - Kansas City, Mo.

E. C. ATKINS & CO., Indianapolis, Indiana.

We make a Specialty of Fine High-Grade Saws.

Atkins' Tuttle Tooth One-Man Saw.

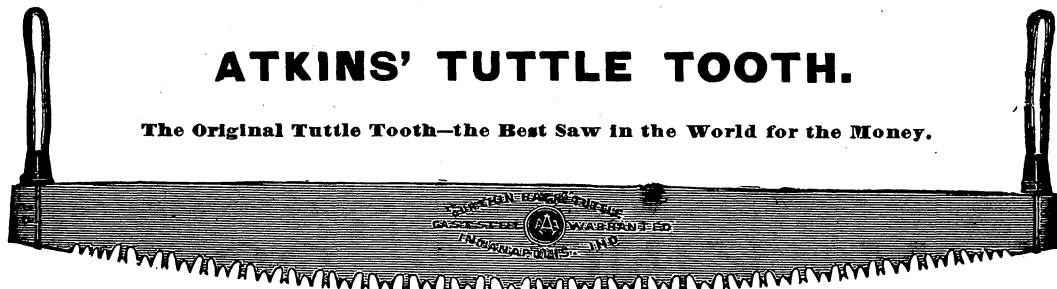


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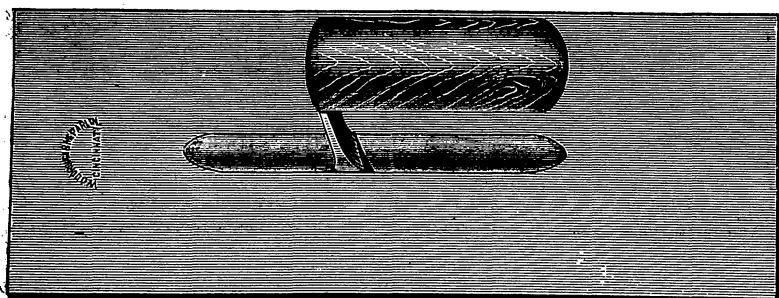
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ATKINS' TUTTLE TOOTH.

The Original Tuttle Tooth—the Best Saw in the World for the Money.



THE NATIONAL SAW CO., 96 AND 98 Reade St., New York.



The famous Woodrough & McParlin Cincinnati Plastering Trowel. "Once Introduced: it sells itself."

The Plastering Trowels manufactured by us have long been favorably known in every city in the United States and Canada. The increasing demand for them by Plasterers attests their Superiority over all others, and confirms their reputation for Uniform High Quality and Durability.

Three Essentials

IN THE MODERN
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- 1.—Teeth of uniform thickness.
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For **10 YEARS** the Simonds Crescent-ground Cross-cut Saw (the only Saw on the market possessing these **ESSENTIALS**) has stood out prominently in contrast with all other makes of cross-cut saws. It has been the **CRESCENT-GROUND** against the **FIELD--MODERN IDEAS** against **ANCIENT METHODS**.

TO-DAY the Crescent-ground Saw is in use in every important lumber camp in the United States. Manufacturers have endeavored to imitate it, but the Machinery producing the Saw, the Process by which it is produced, and **THE SAW**, are patented. All imitations are but involuntary acknowledgments of the **SUPERIORITY** of

THE CRESCENT-GROUND CROSS-CUT SAW.

(PATENTED DEC. 28, 1882.)

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SIMONDS SAW CO.,

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NEW ADJUSTABLE BENCH LEVEL.

WITH GROUND AND GRADUATED VIAL.

4-6 and 8 inch.

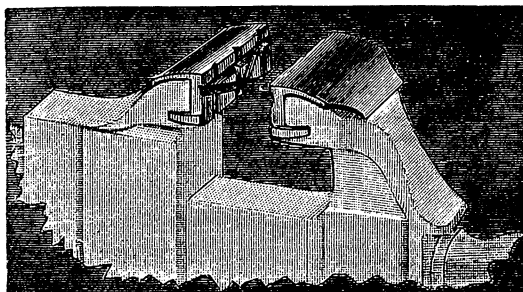


Three Sizes.

MANUFACTURED BY

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BINGHAM PATENT VISE JAW CAP

Will Fit any Kind of Vise.

For protecting finished work. Will hold finished rods of any shape without injury.

3 1/4 inch, per pair, 40 cents.
4 " " " " 60 "
4 1/4 " " " " 80 "

PRENTISS VISE CO.

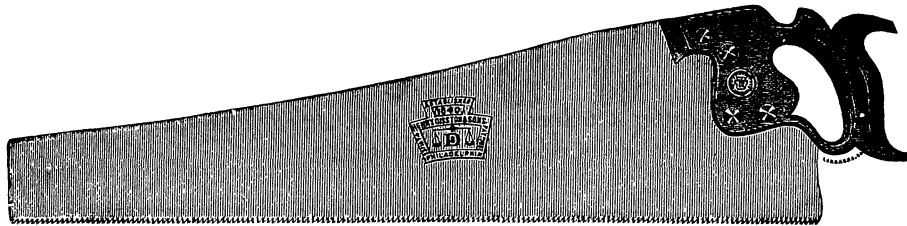
44 Barclay St., New York.

"If you want a Saw It is best to get one with a name on it which has a reputation.
A man who has made a reputation for his goods knows its value as well as its cost and will maintain it."—HENRY DISSTON.

THE SAWS THAT LEAD THEM ALL

DISSTON & SONS' PATENT D-8 HAND SAW.

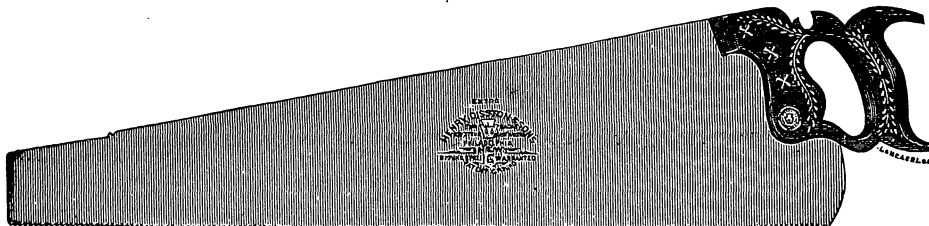
"THE
SAW,"
HOW
TO
CHOOSE
IT,
AND
HOW
TO
KEEP
IN
ORDER,
Sent
Free
on
Receipt
of
Name
and
Post Office
Address.



This Saw combines all the valuable improvements in Hand Saws that have been made by us of late. The first and most important is the hollow or skew back, the success of which can best be attested by the number sold. The peculiar shape of the butt or heel, coupled with the new method of fastening to the handle, give a full stroke of the blade without fear of catching or hooking in the work ; and as the handle is put further on the blade you have a full stop on the proper point and a greater command over your Saw, by reason of being two inches nearer the point, which must give more power.

The Saw being let into the handle on a circle, has a perfect bearing, which, with the new screws, makes it stronger and almost impossible to work loose, and avoids the unsightly gap that is seen on the back of the old style handle. All the above features are patented.

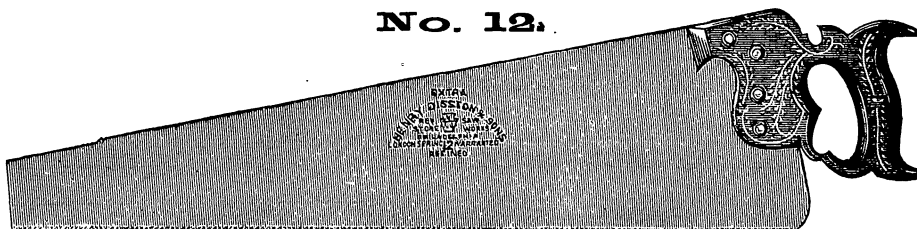
Our New No. 16 Premium Saw.



AN EXTRA FINE SAW IN EVERY RESPECT.

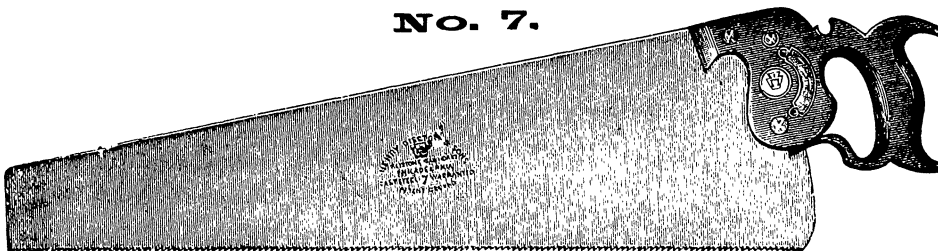
Having the Latest Close up Handle, Spring Steel Blade, Extra Thin Back, Finely Grained, with an Apple Handle and Four Brass Centennial Screws.

No. 12.



Disston & Sons' Extra Refined London Spring Steel, Selected and highly Polished Blade, Handle Carved and Polished, 4 Improved Brass Screws, the finest Hand Saw manufactured.

No. 7.



DISSTON & SONS' Cast-Steel, Warranted, Beech Handle, Polished Edge, 4 Improved Screws, Grained Blade.

"POCKET
EDITION
OF
THE
SAWYER"
and
"LUMBER-
MAN'S
HAND
BOOK,"
Sent
Free
on
Receipt
of
Name
and
Post Office
Address.

ASK YOUR DEALER TO ORDER THEM FOR YOU.

HENRY DISSTON & SONS

(INCORPORATED),

Keystone Saw. Tool, Steel and File Works, Philadelphia, Pa.

FACTORIES AT
AKRON, - OHIO.
CANTON, - OHIO.

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— MANUFACTURERS OF —

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 [X.F.] AND INCREMENT CUT FILES.

THE LARGEST AND MOST COMPLETE FILE WORKS IN THE WORLD.

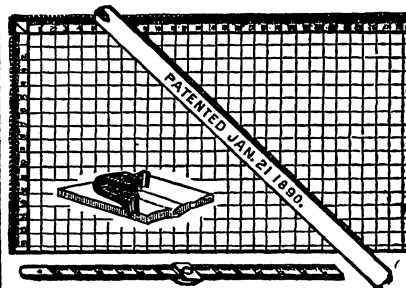
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Manufacture and keep in stock a full line of **FILES** and **RASPS** only, for which we claim special advantages over the ordinary goods, and ask domestic and foreign buyers to allow us to compete for their trade.
Superiority acknowledged wherever used, sold or exhibited.

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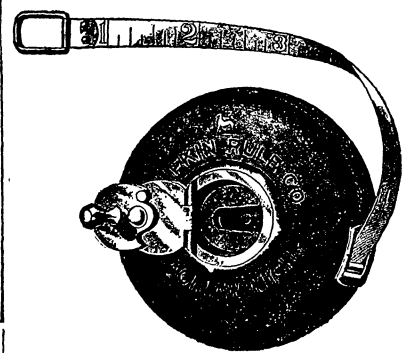
Cuts any Fraction of an inch by Eighths.

Unequaled for accuracy and quick work in cutting square or at any angle. Saves breakages, &c.

—ALSO—

IMPROVED TRAMMEL RULE for Cutting Circles
 From 3 inches up to 48 inches, Segments, Gothic Shapes, &c.

Send for Circular.

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“RELIABLE”
Steel Measuring Tapes.

Entirely new. Handle or crank when closed is perfectly flush with leather case. Opens by pressing button on opposite side and folds out double, giving increased leverage. Best and most convenient steel tape on the market. Fully guaranteed. Will send samples on approval.

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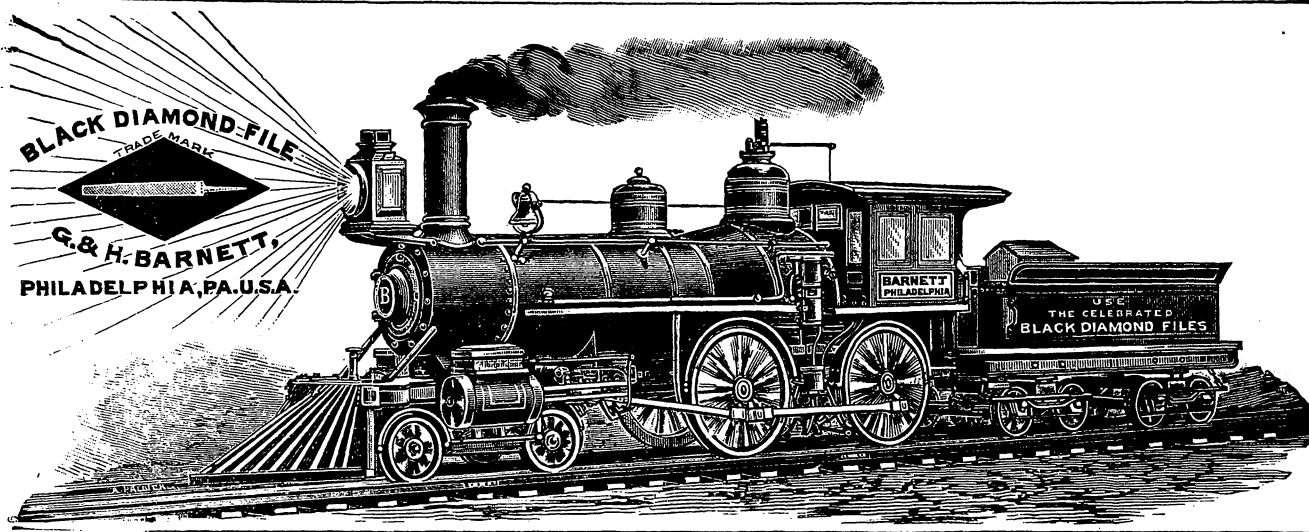
AND OTHER TOOL SPECIALTIES.

The Combination Haft contains six Brad-Awls, one Chisel, Screw Driver, Diamond Point Awl, Marking Awl, Tack Puller and Reamer. Send for Circular and Prices.

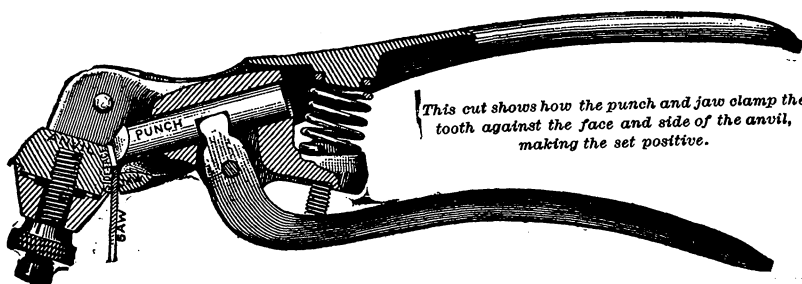
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 For Every Purpose.
 Steel Letters & Figures.
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THE TAINTOR POSITIVE SAW SET.



Mechanics are now inquiring for this tool, and Hardware Dealers should have them in stock, or at least have a sample.

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DEAR SIR:—Have tried your Saw Set, and find it the best in every particular and have used a great many different kinds for twenty years.

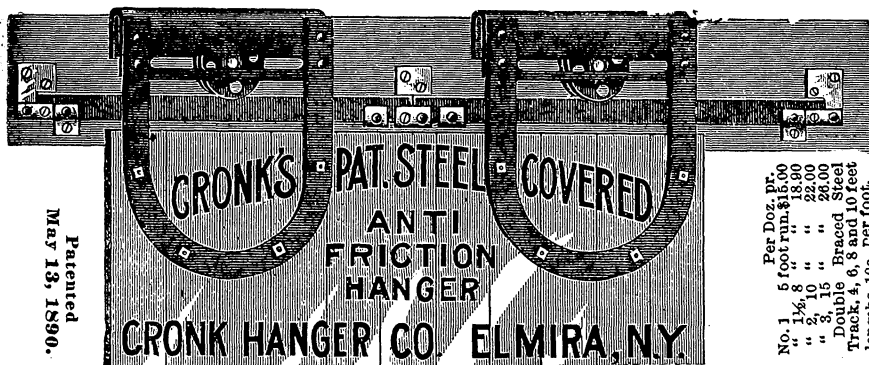
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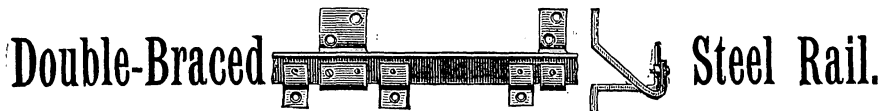
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Per Doz. pr.
No. 1, 5 foot run, \$18.00
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" 2, 10 " " 26.00
" 3, 15 " " 30.00
Double Braced Steel
Track, 4, 6, 8 and 10 feet
lengths, 10c. per foot.

We are the original makers of steel covered hangers and all others are imitations. Beware of infringements, as we shall protect our rights.

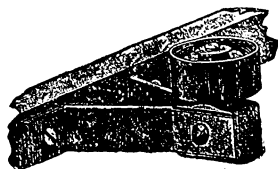
In our Steel Covered Hangers we have all the desirable features of the Best Hangers in the market, and with that we combine the cover for wheels SO NO ICE OR SNOW can reach the wheels, and making this cover as we do, we stiffen it so it is the strongest Hanger in the market, and we believe it is just perfect. Would be glad to have you try a small order and satisfy yourself.



PATENTED JUNE 12, 1888.

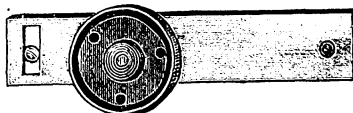
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Cronk's Adjustable Stay Roller.



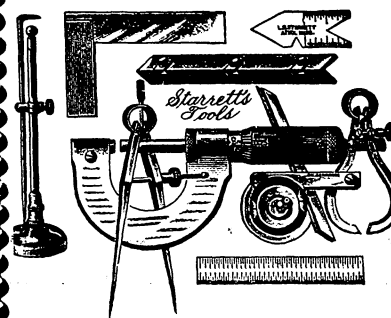
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Cronk's Inside Adjustable Stay.



Is cheap, simple and durable, and much better than a cleat nailed on the floor for this avoids all friction and leaves no place for dirt to accumulate. \$2.00 per doz. No inside door can be properly hung without this stay.

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want tools that are warranted accurate, best in workmanship, latest in design, finest in finish.

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Have established and maintained their reputation, for superiority,
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and are still in increasing demand. As in the past, it is the unalterable
DETERMINATION OF THE HOUSE TO SEND OUT NOTHING BUT WHAT IS OF THE HIGHEST POSSIBLE QUALITY.

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Pocket and Table Cutlery, Scissors, Razors, Erasers, &c., &c.

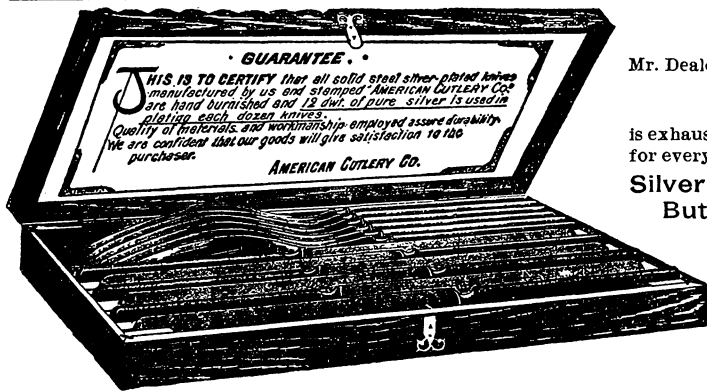
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Any Infringements of our Name and Corporate Mark will be promptly prosecuted.

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Mr. Dealer, that because Xmas is past our Stock of

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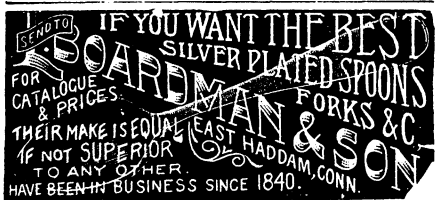
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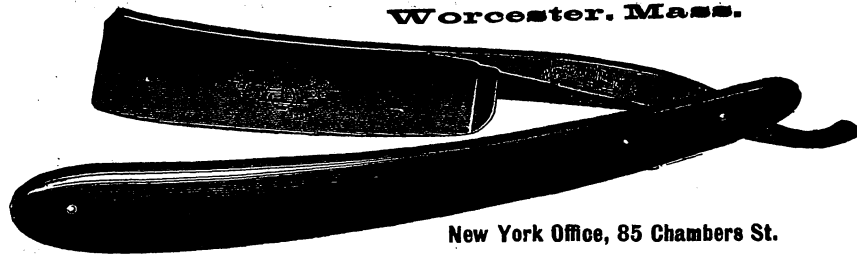
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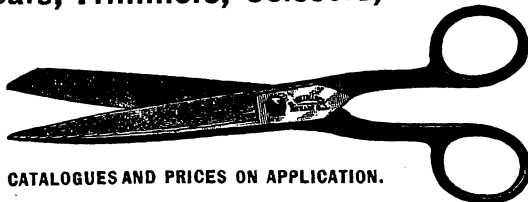
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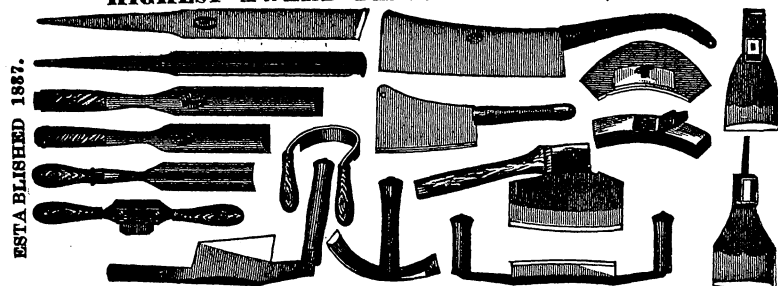
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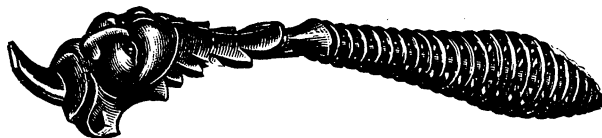


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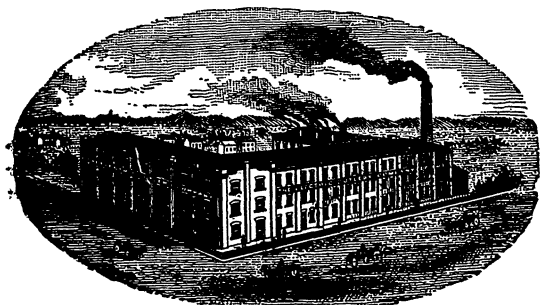
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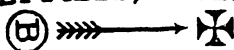
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Dealers will find that it sells far more readily than the old style.

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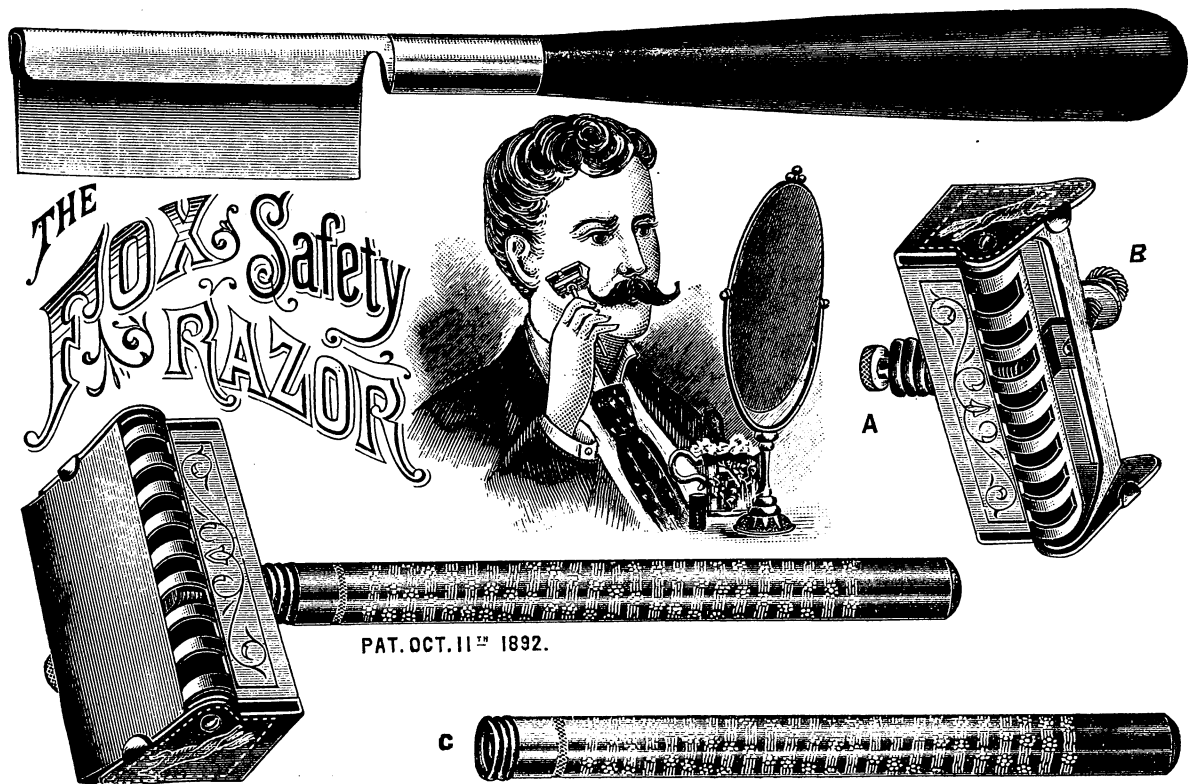
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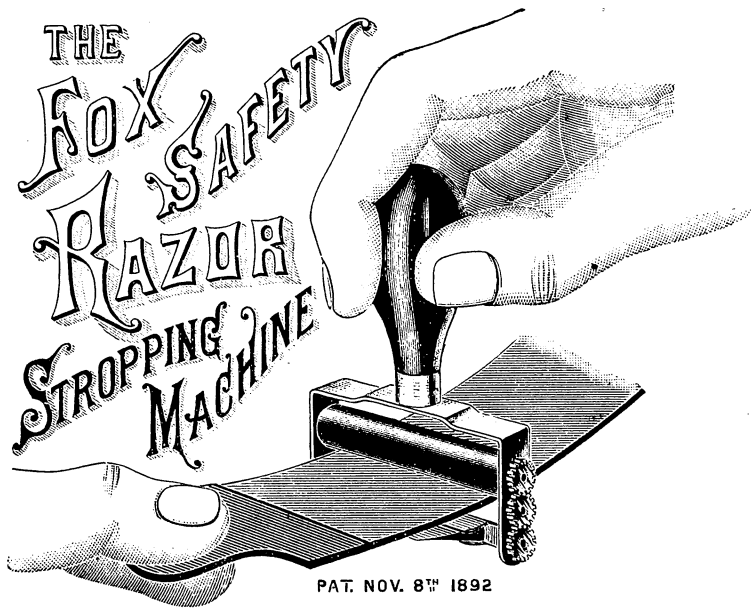


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Makes Shaving a Luxury. No danger of Cutting. Silver Plated Frame.
The Finest and Most Practical Safety Razor in the World.

DIRECTIONS:

After the blade is inserted, turn the rear set screw *A*, which presses against the inner frame on which the blade rests; the latter one will be lifted until its back strikes the top screw *B*, where it is held. In case the blade is too low to the guard, loosen top screw *B* first, and turn on rear screw *A*. If blade is too high, loosen screw *A* and turn on screw *B* until the blade is in the desired position. By loosening the rear set screw *A* only, the inner frame falls back, and the blade can easily be taken out. If once set correctly, the top screw *B* need not be used any more. **THE FOX SAFETY RAZOR** is the only one with a perfectly adjustable blade.



Slide blade in the frame holder and pass one end of the Swing Strop (*stropping side downward*) through the opening between the roller and the frame, as shown in cut. Then move forward and backward over the strop with a slight pressure, and the blade will be reversed every time, automatically turned on its back, and pressed against the strop.

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Sole Manufacturer and Patentee,

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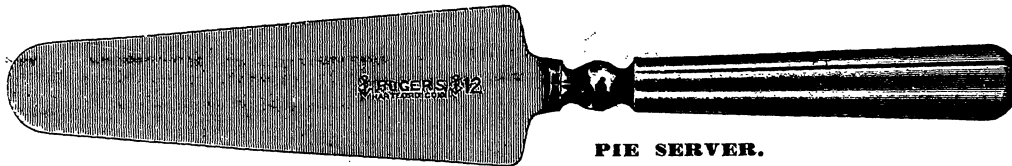
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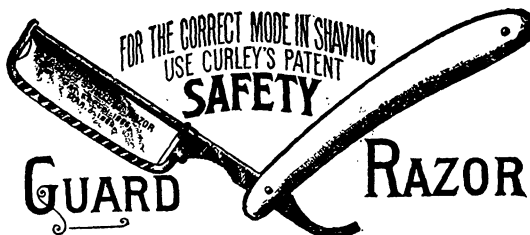
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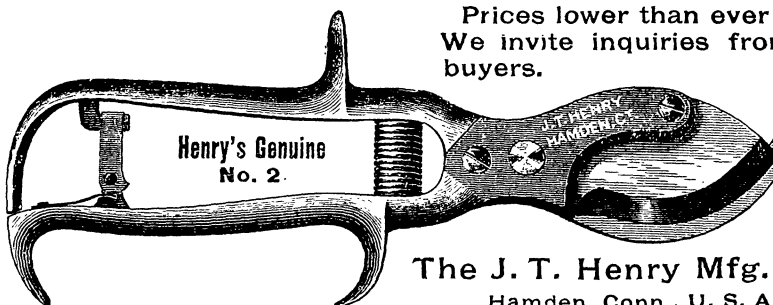
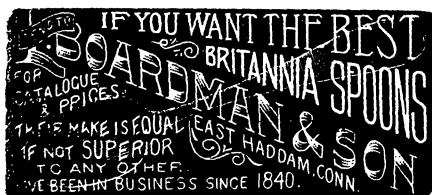
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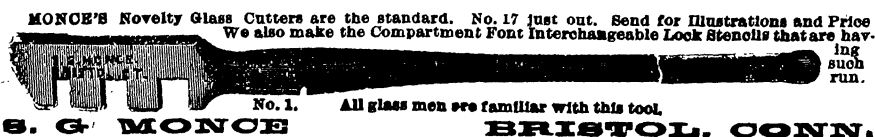
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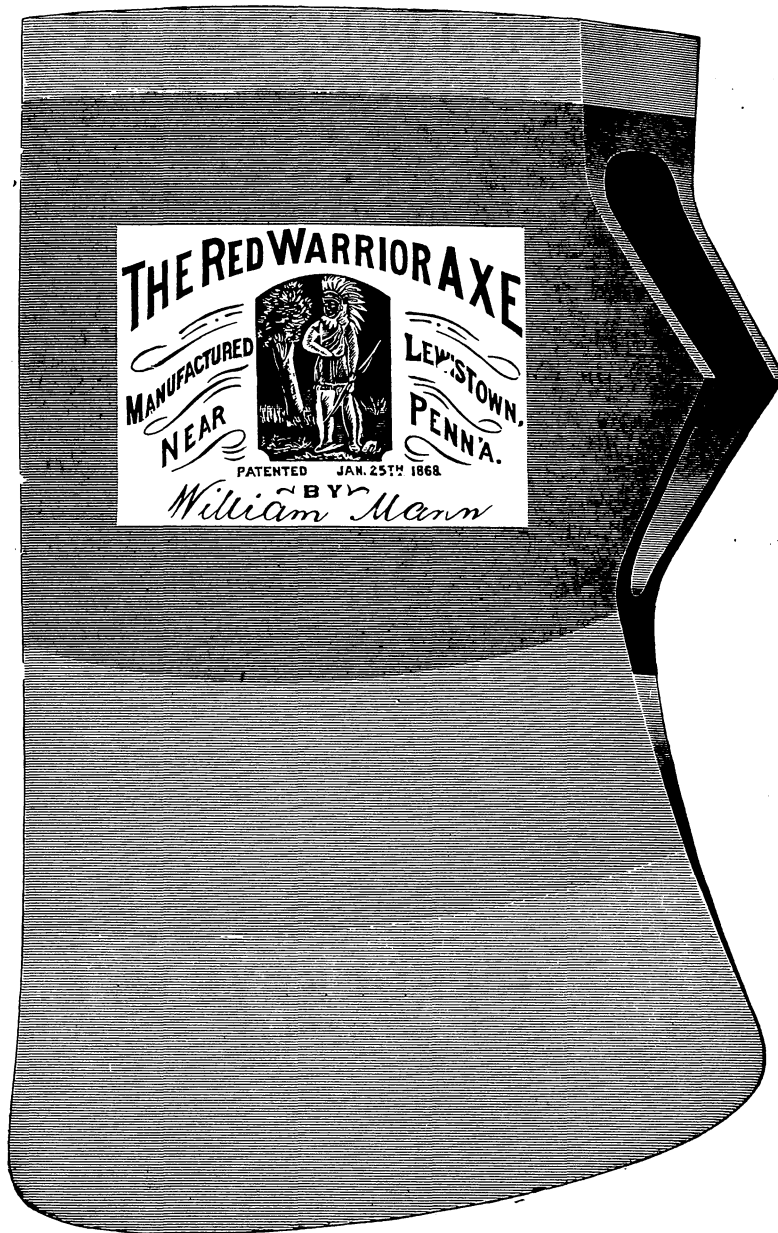
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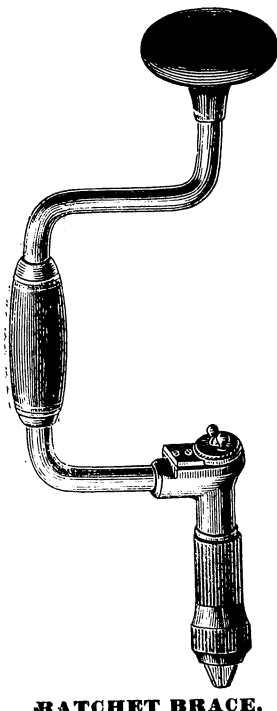
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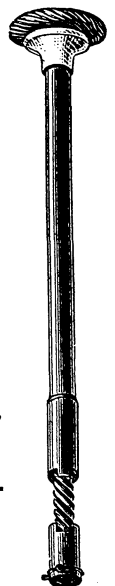
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This AUGER bores rapidly and is easily operated. It will open wide when dumping the dirt, which may be entirely removed from the hole—whether wet or dry, fine or coarse—by closing the blades. The GEM is the only post hole auger having blades so shaped as to allow them to close in a perfect manner at points, and sufficiently to retain the dryest and even the finest dirt or sand. This great improvement and point of

ity over any and all other augers is the result of blades of far shape, which shape is

superior post hole of peculiarly patented.

Th

Will open with the using one other machine one-half may be used either way first taking of main replacing

Boss 2-speed Boring Machine.

operate a two-inch auger same effort required in and one-half inch in any chine, and for the small have a speed two and times faster. Two augers kept in the machine, to of which it is only need to point it downward by ing the gear frame out frame inverting and it:

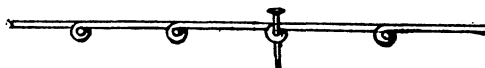
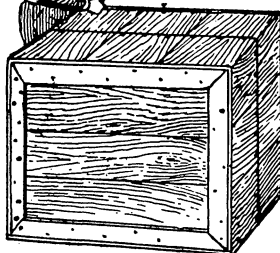
Lightning Drain Cleaner.

The Drain Cleaner is a hand machine used as a shovel. The dirt pan is made of No. 18 Steel 3 inches deep and 12 inches long, with vertical end in rear. It has a decided advantage over other machines in digging water and dirt. It is also used for letting down tilting in ditches, which is very convenient and saves extra labor of standing and working in muddy ditches. The iron adjusting rod can be used with great rapidity and ease and can be adjusted to pull or push with as quick a motion as may be desired. To use it in any particular shape tighten the set screw.

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Arranged by R. R. WILLIAMS, Hardware Editor of the Iron Age.

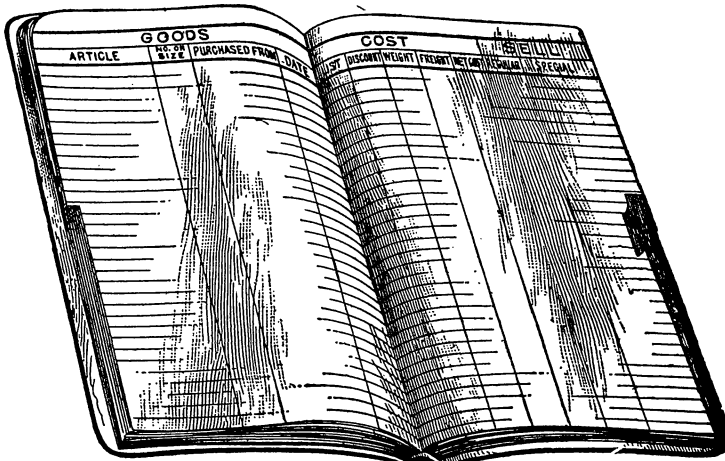
These Books are printed on paper of superior quality and bound in grain seal leather.

Columns are provided for the name and number or size, for noting from whom purchased, date of quotation or purchase, list and discount, and for entering freight expenses as an element of cost. Under the heading of selling prices, the regular and any special price or remarks in regard to the goods are given place. This book goes into considerable detail in describing the goods and cost prices. It has been arranged in accordance with the views of many Hardwaremen whose methods are careful and exact.

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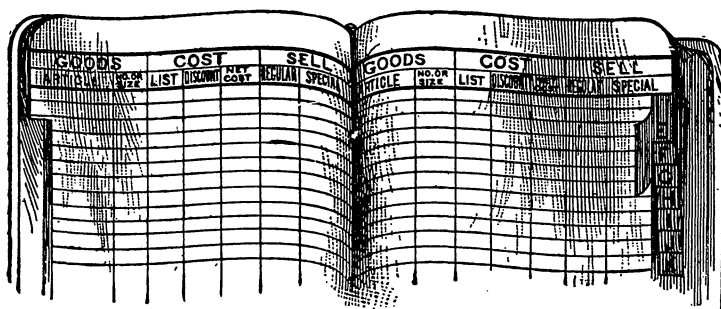
Hardware Price Book A.

In this book each page is complete, and the record of prices does not, as in Book A, run across two pages. Thus it accommodates a larger range of goods with much less detail in the record. It is adapted for office or store use, and by the use of familiar abbreviations, sufficiently large for the convenient and concise record of prices.

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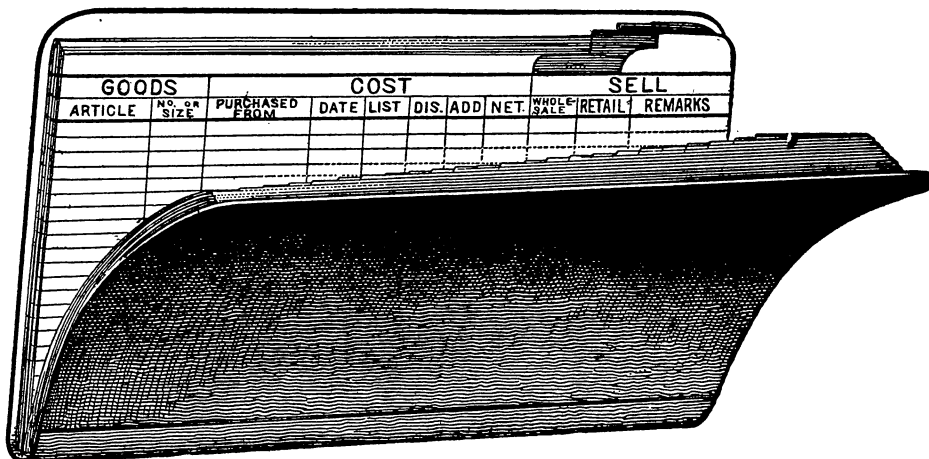
Hardware Price Book B.

The headings in Book C run across the top, in a line parallel with the hinge. In this way a very complete record can be kept on a single page. The details of weight and freight contained in Book A are omitted, and a single column headed "Add" given for the insertion of freight or other expenses which it is desirable to include in the cost. Under the selling prices space is left for the wholesale price, the retail price, and also for any remarks in regard to cost of the goods, desirability of pushing them, or other matters.

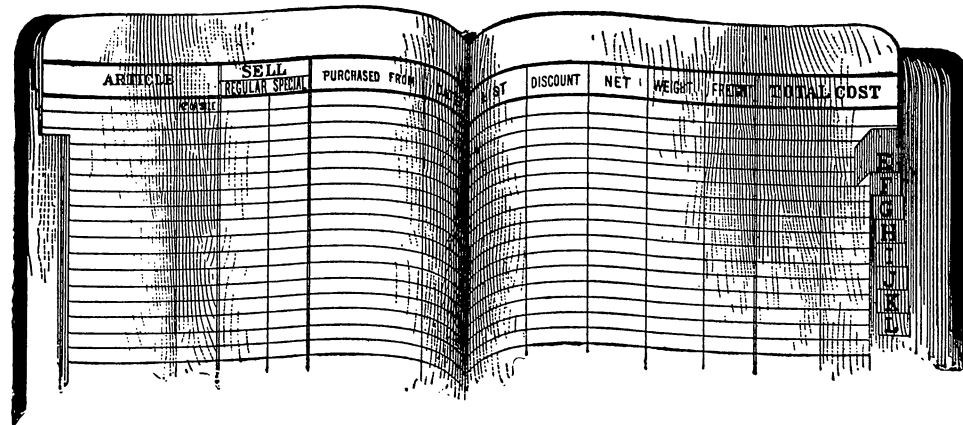
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Hardware Price Book C.



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arrangement is adapted to the requirements of the trade in this direction. Size 5¼ x 8 in.; grain seal leather.

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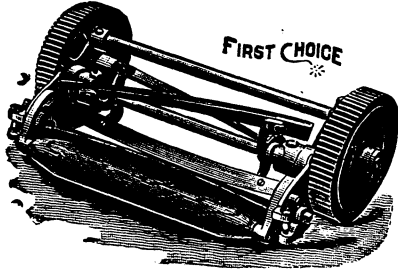
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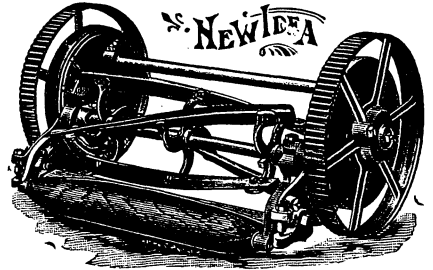
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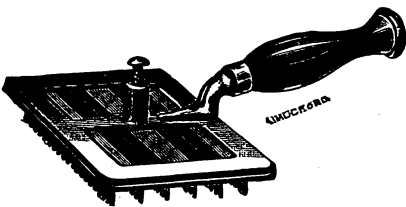
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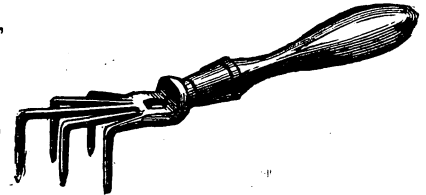


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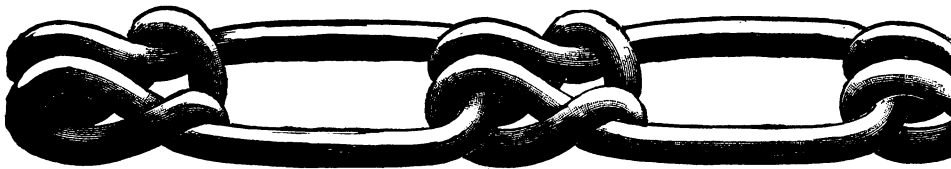
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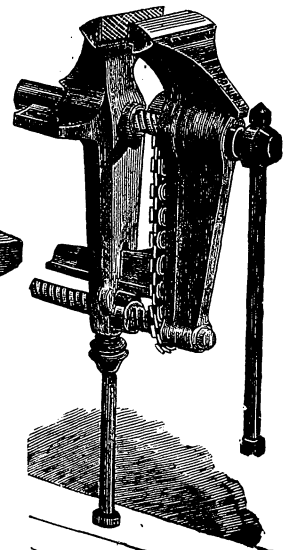
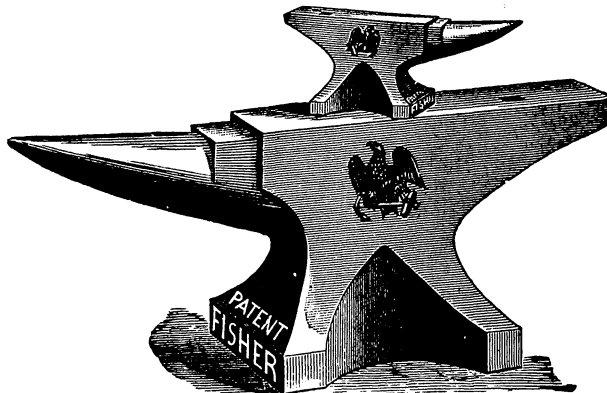
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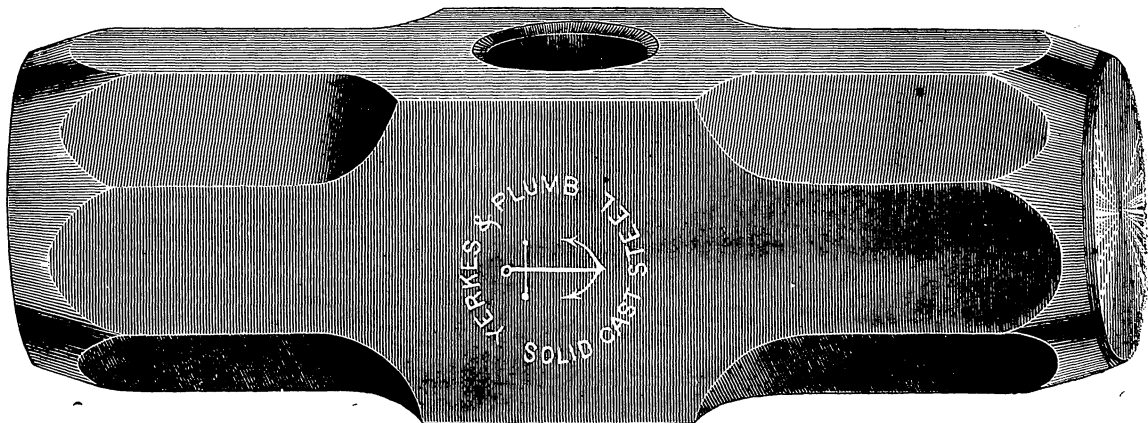
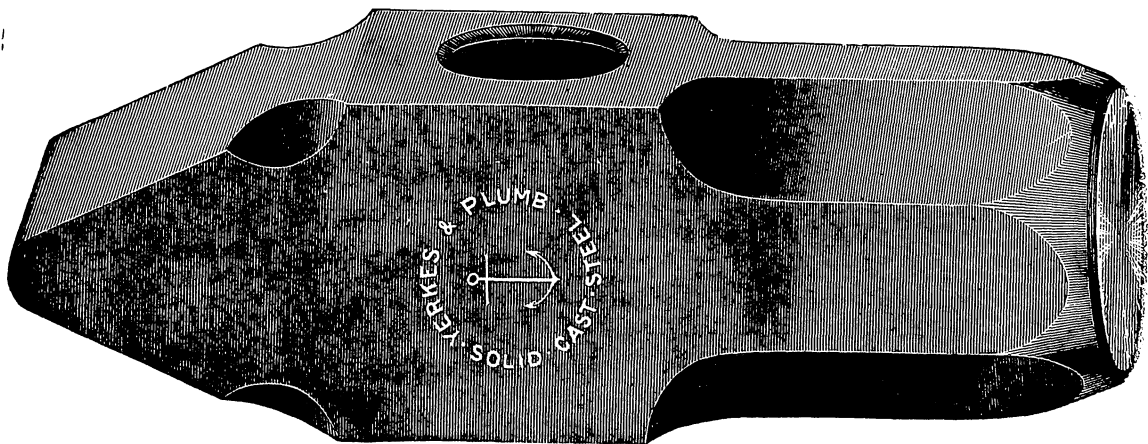
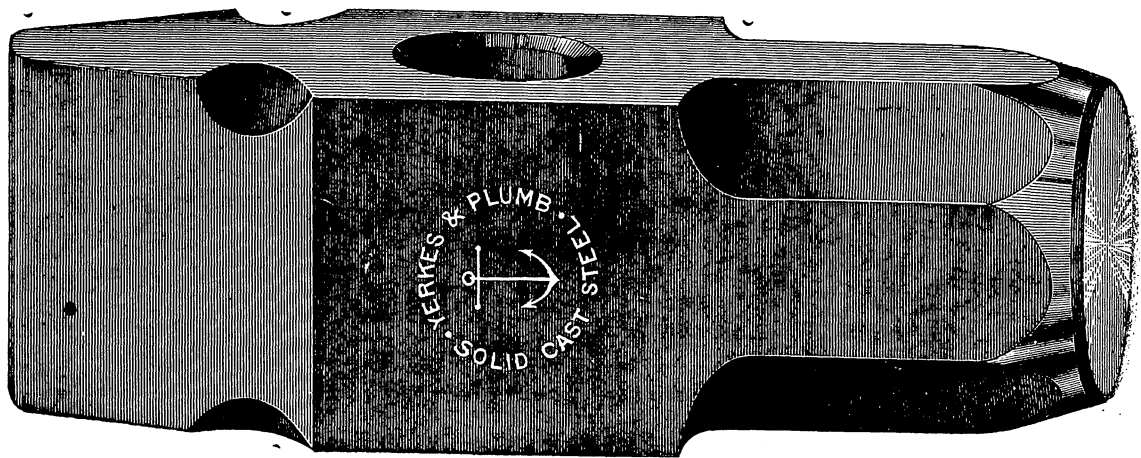
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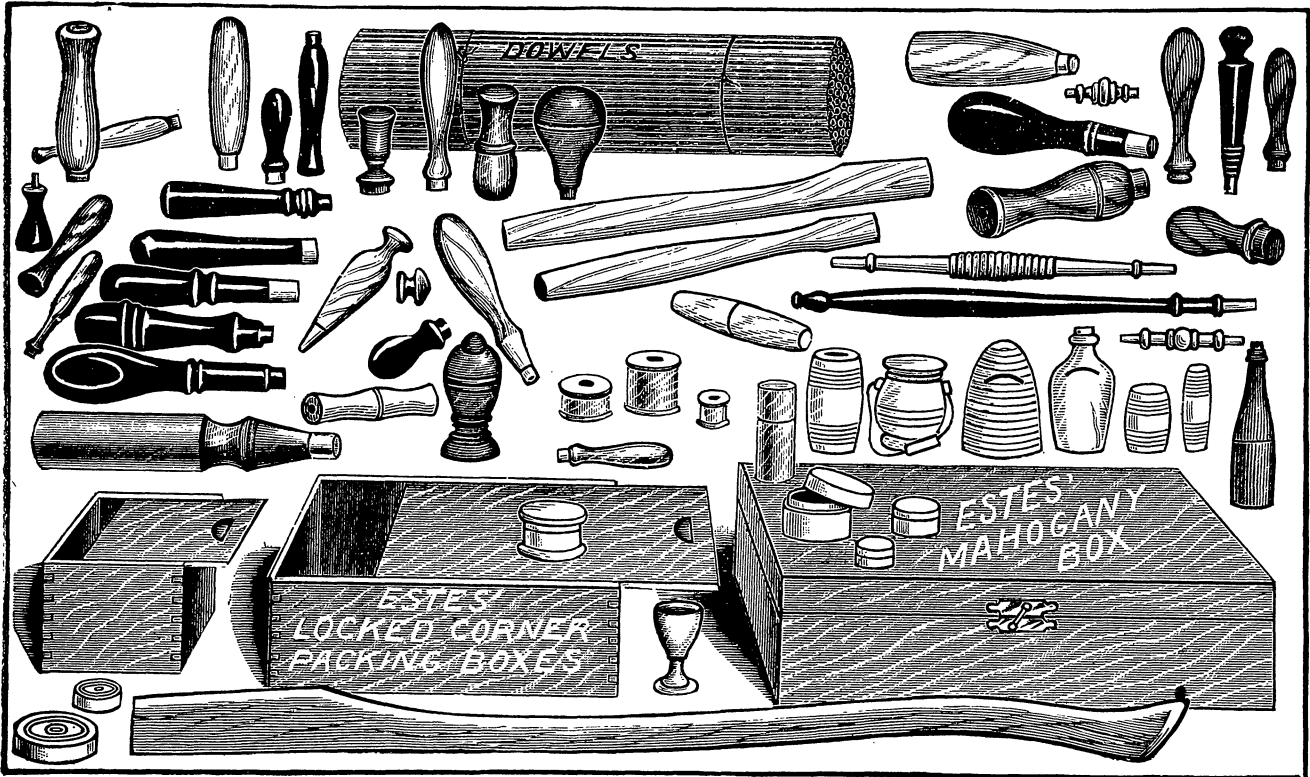
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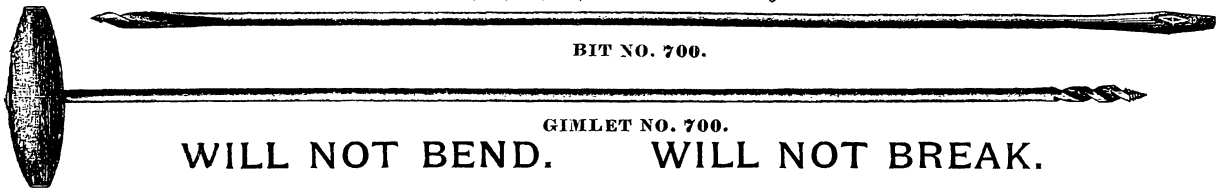
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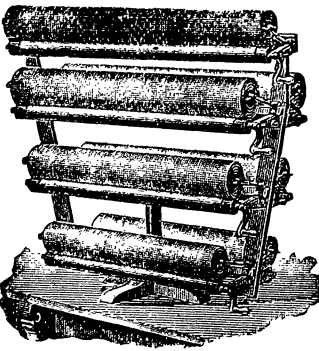


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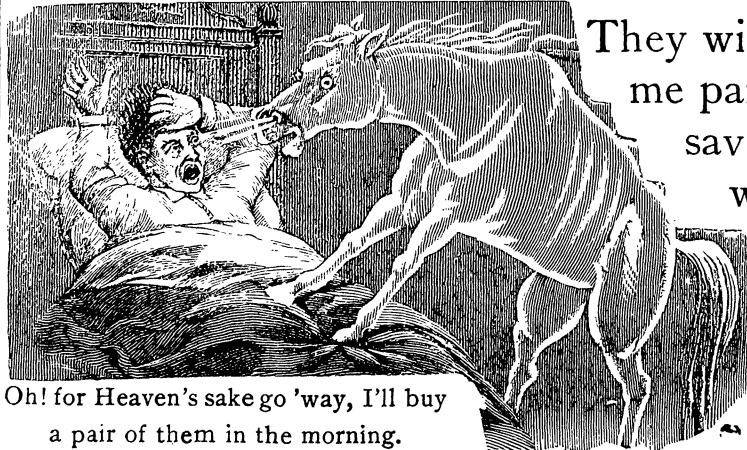
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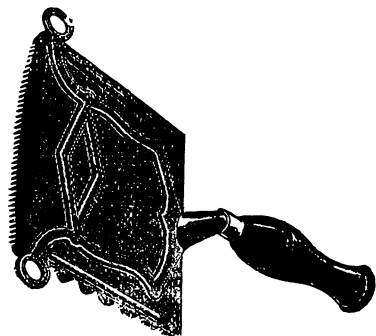
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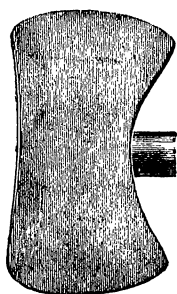
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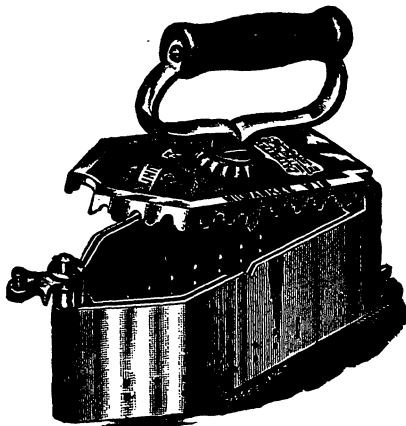


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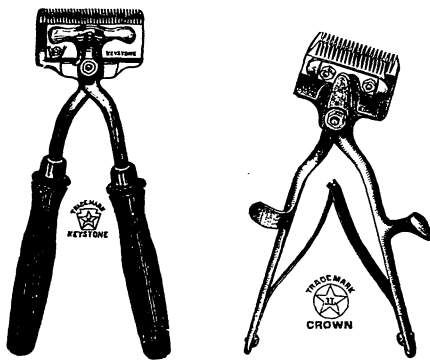
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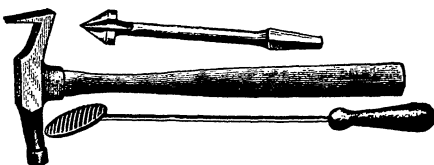
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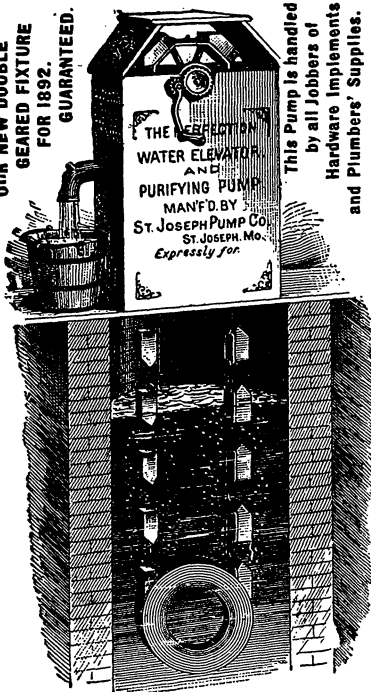
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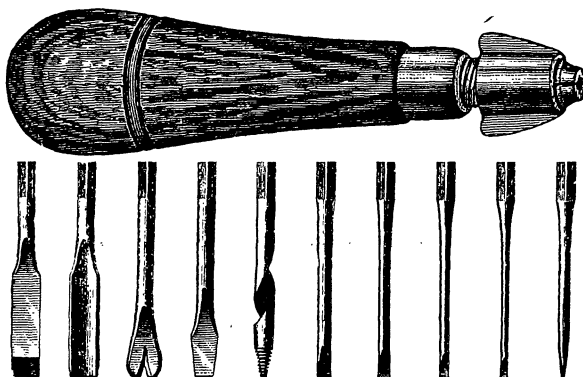
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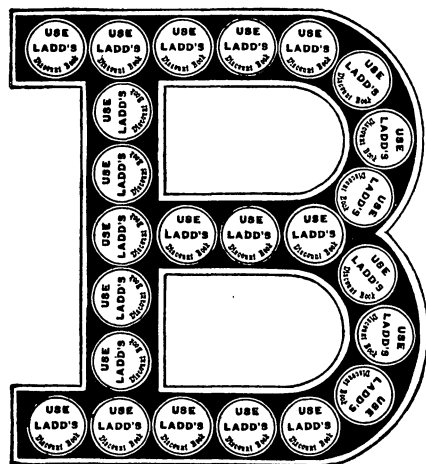
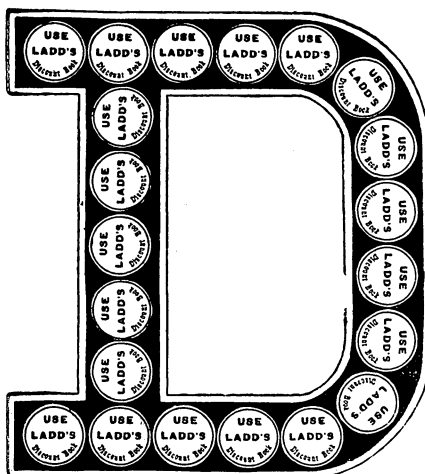
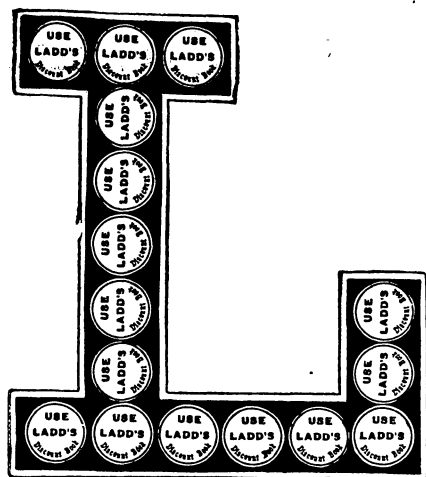


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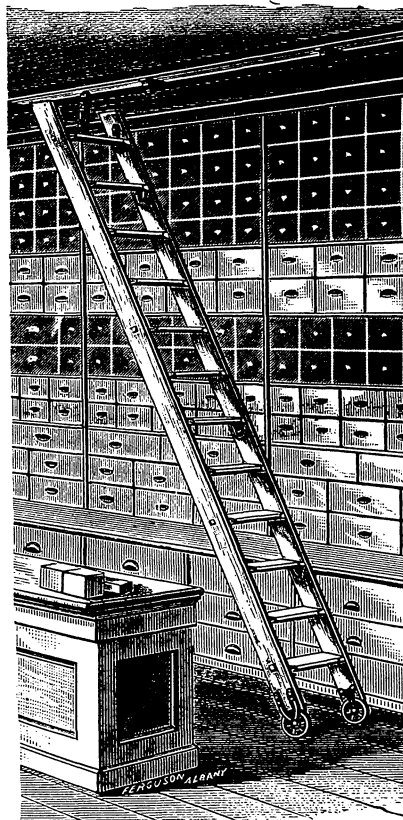
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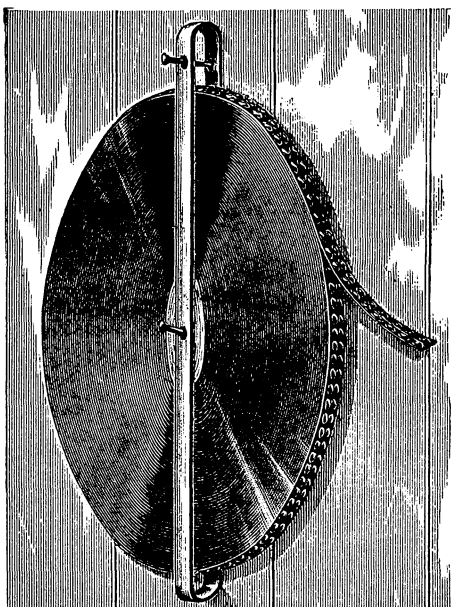
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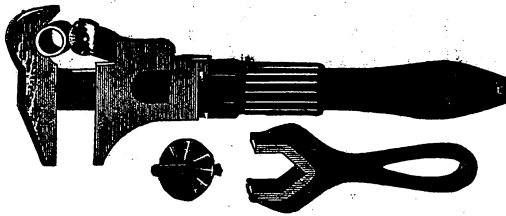


Showing Reel Hung Up Ready for Use.

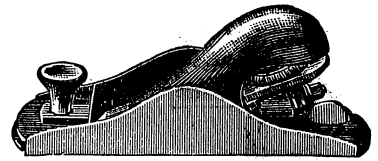
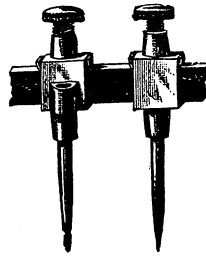
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Blind Hinges, Gate Hinges, Door Butts,
And other HARDWARE SPECIALTIES,
BUFFALO N. Y.

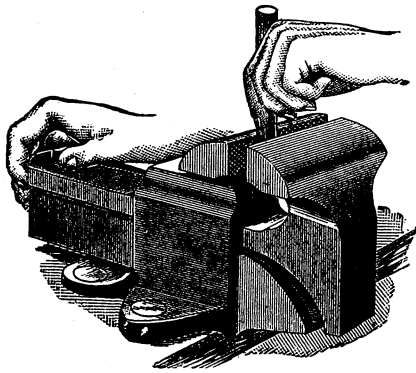
HIGH QUALITY TOOLS



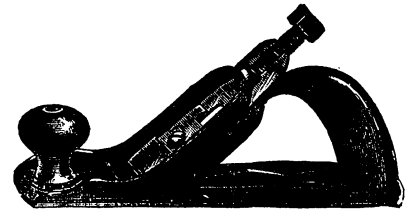
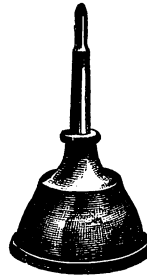
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Short or Long Sleeve Nuts, and
with Pipe Cutter.



Chaplin's Patent Iron Planes,
Corrugated Bottoms,
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Handles.



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Challenge Iron Planes.
Simplicity of Construction.

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Malleable Oilers and Lamps, Pencil Attachments.

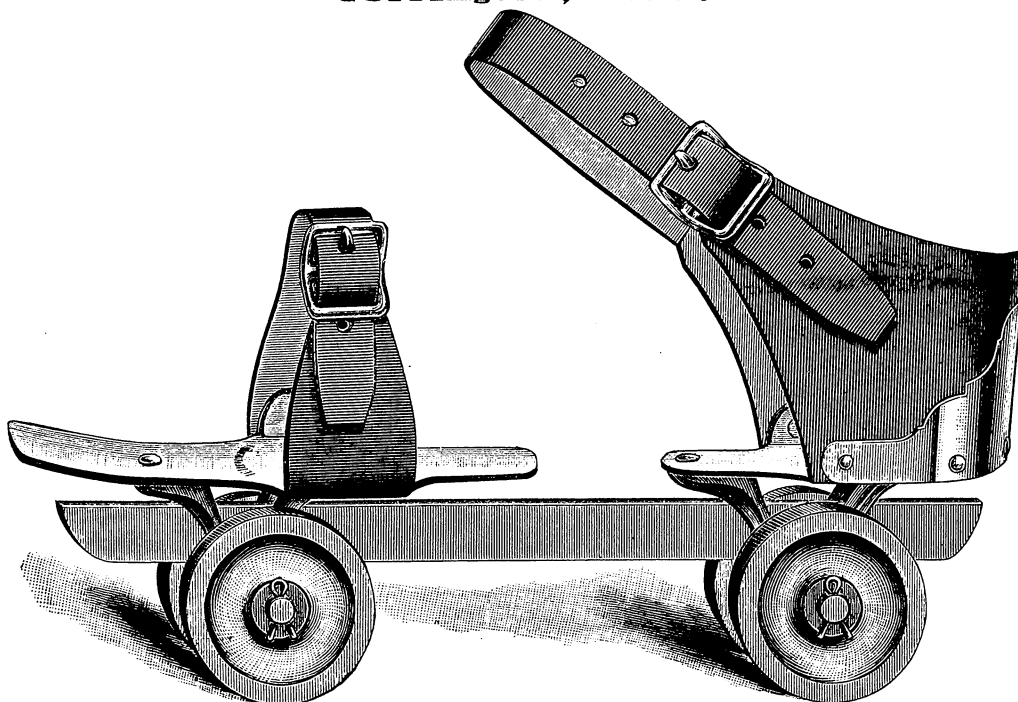
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SIDEWALK AND RINK ROLLER SKATES OF ALL KINDS.

—:MADE BY:—

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Purchasers of the Glue Business of The Le Page Co.

Gloucester, Mass.

New York City.

JOHN J. TOWER, of Tower & Lyon,
New York, President.

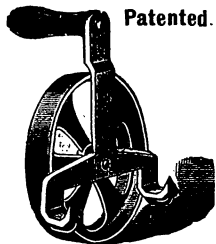
C. E. HUBBARD, Boston.
Treasurer.



The Improved Process Glue Co., having purchased from The Le Page Co., all its patent rights, formulas, glue stock and material, and having secured control of its glue factory, machinery, etc., will continue the manufacture of Liquid Fish Glues in all the various grades heretofore offered by The Le Page Co., under the personal supervision of Mr. WM. N. LE PAGE, and under the Improved Process Patent issued October 26th, 1886. As is well known, the Improved Process by which these goods are made assures the highest strength with thorough uniformity as to quality, consistency and color. We call special attention to our Improved Process Family Glues, neatly put up for family use, and also to our Improved Process Carriage Glue for wood-work, put up in every variety of size and style. This Carriage Glue is undoubtedly the strongest and best glue for every variety of cabinet and wood-work, and has earned its high reputation. All our canned glues are put up with the new patent cap or fastening, patented January 22d, 1889, which has proved a great convenience and success. Our glues will be readily identified by our characteristic Blue Label, and the Trade-Mark shown at the head of this page. Send for Price-List. Messrs. Tower & Lyon will have charge of our New York office. Very truly yours,

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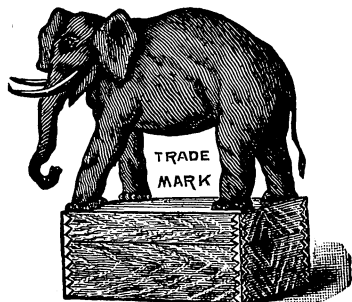
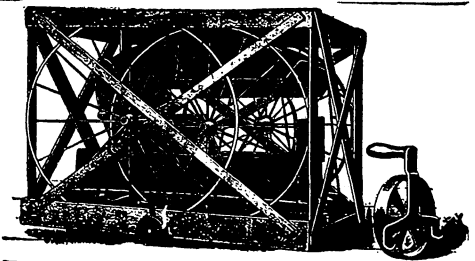


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Fits any size Crate or Box,
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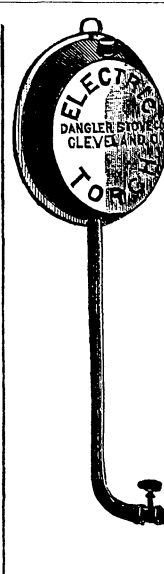
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14 JETS OF LIGHT

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FOR lighting manufacturing establishments, such as Rolling Mills, Foundries, Machine Shops, Engine Rooms, &c., &c., with a convenient, portable brilliant, steady light, and by cheaper means than by Coal Gas.

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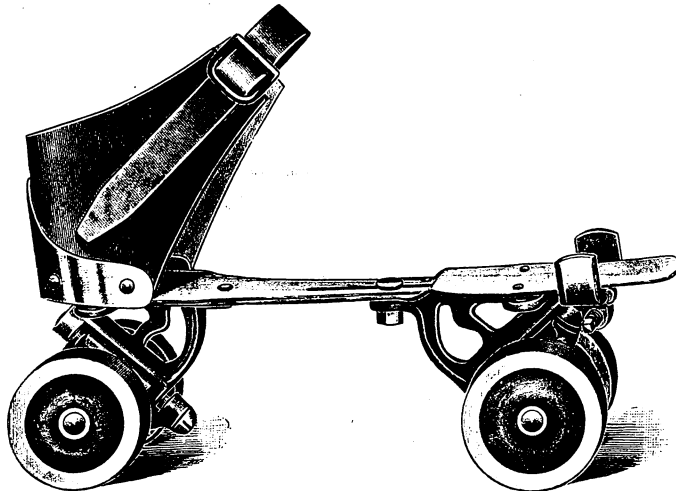
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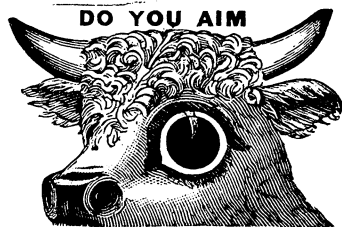


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MADE IN ALL CLAMP AND HALF CLAMP FASTENINGS.

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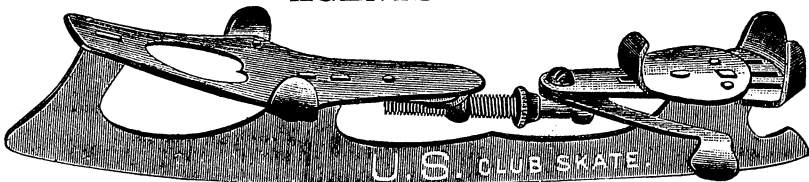
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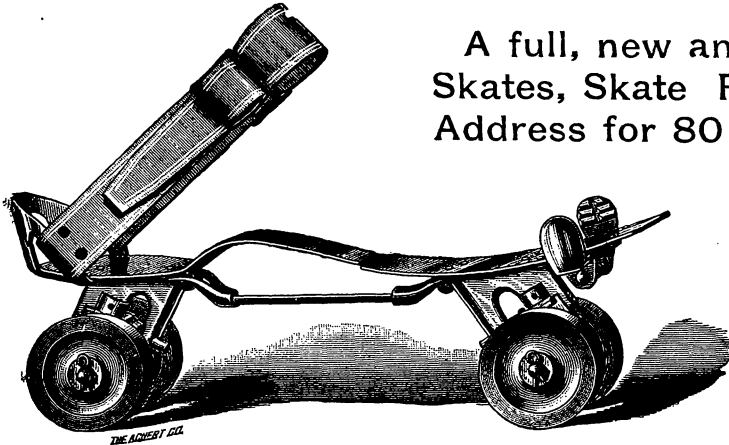
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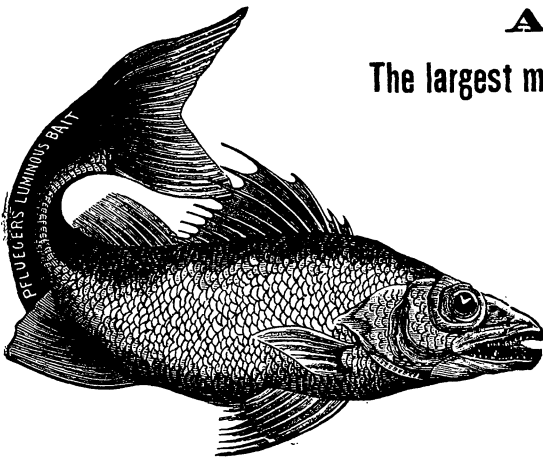
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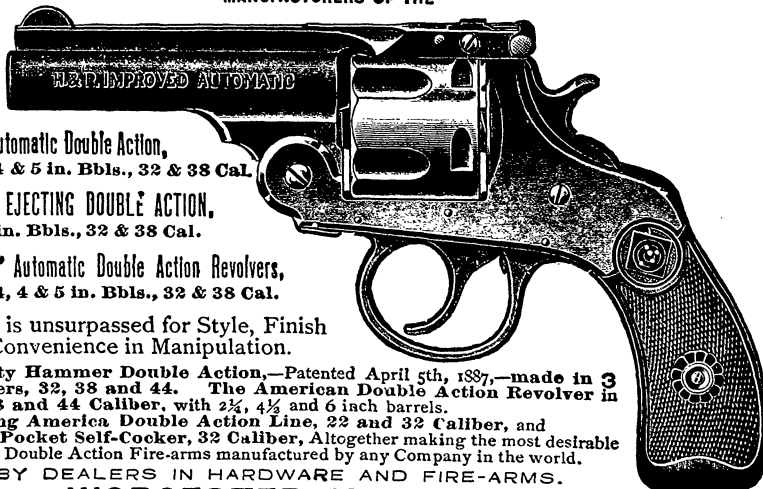


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Improved Automatic Double Action,
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3 1-4 in. Bbls., 32 & 38 Cal.

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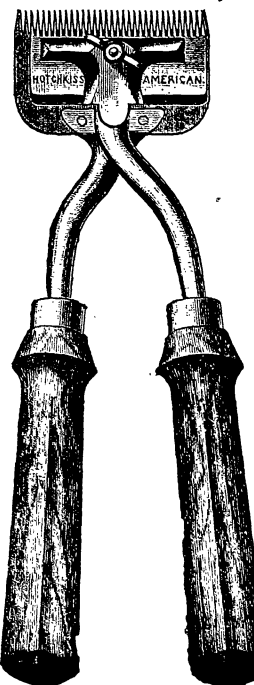
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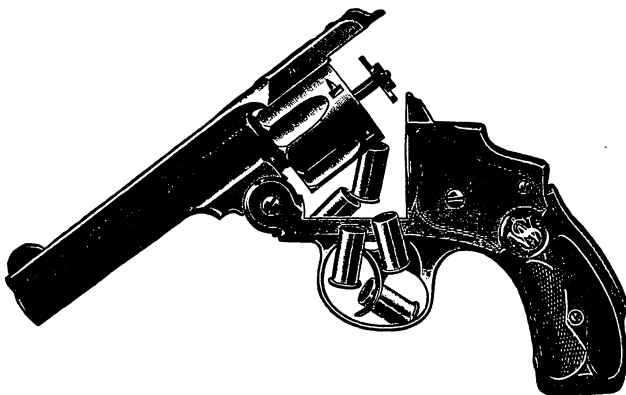
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Provided with Automatic
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The latest production from
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Calibre 32, Weight 14½ oz.

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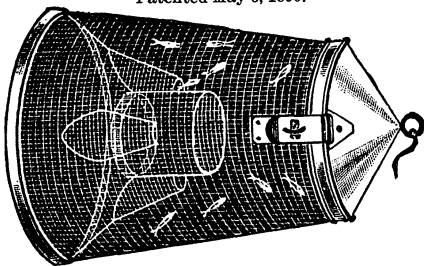
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SUPERIORITY IN EVERY POINT UNIVERSALLY CONCEDED.

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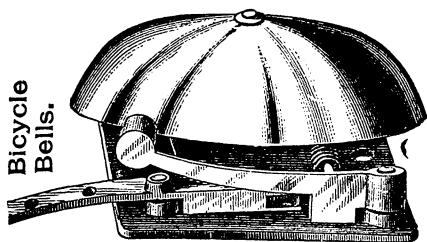
Illinois State Fish Commission,
Office of S. P. Bartlett, Sec'y,
QUINCY, ILL., Jan. 19, 1892.

Messrs. Cochenour & Wilson, Olney, Ill.
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Yours respectfully,
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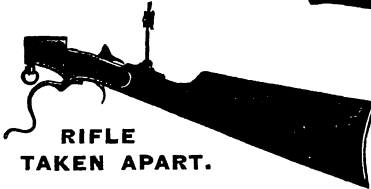


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Made for the 22 or 25 Rim Fire Cartridge.

WEIGHT, 4½ POUNDS.



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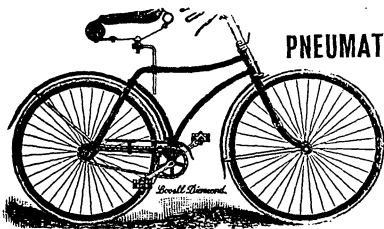
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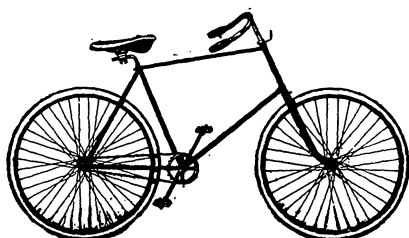
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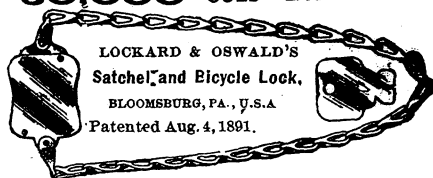
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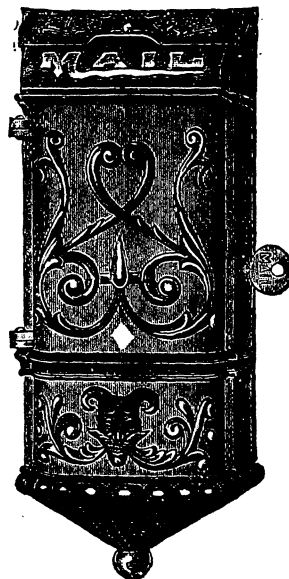


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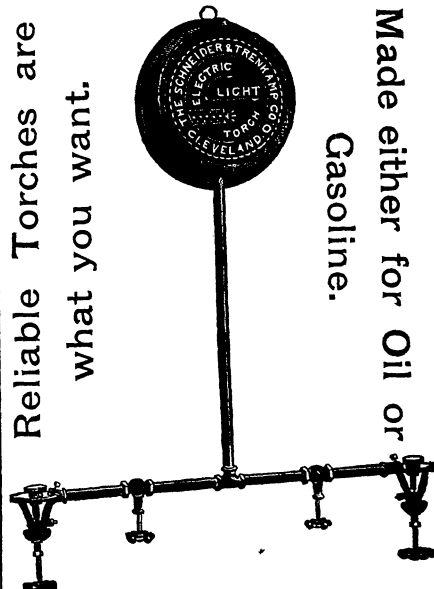
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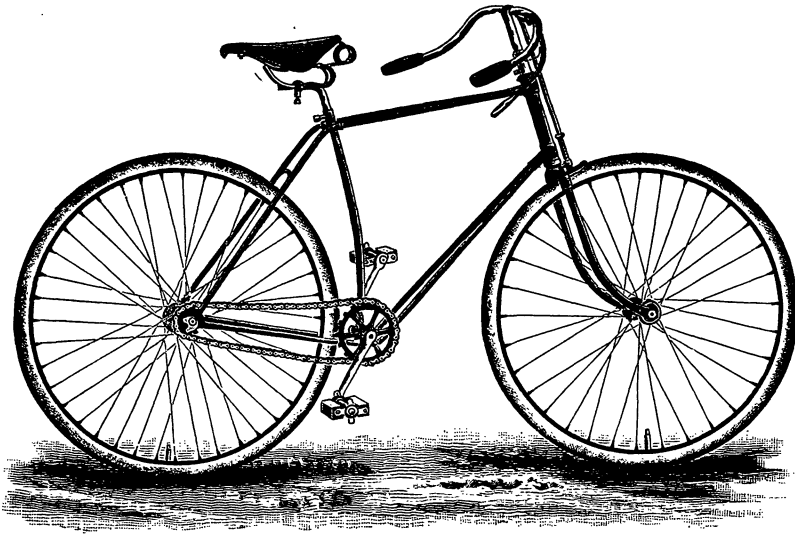
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Made specially to be sold by Hardware Stores. Thus
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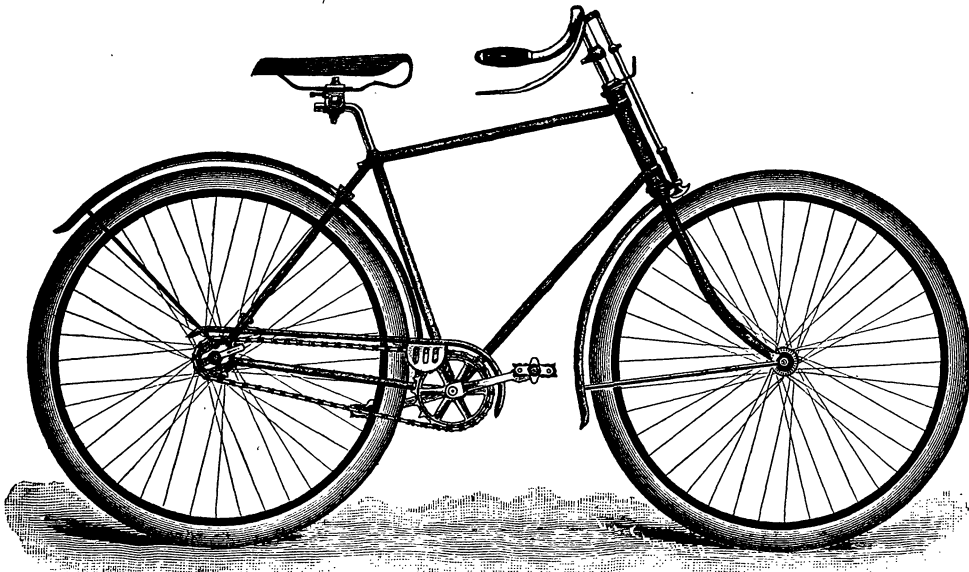
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JET KNOBS, BRONZE ROSES,
JET KNOBS, BRONZE PLATED ROSES,
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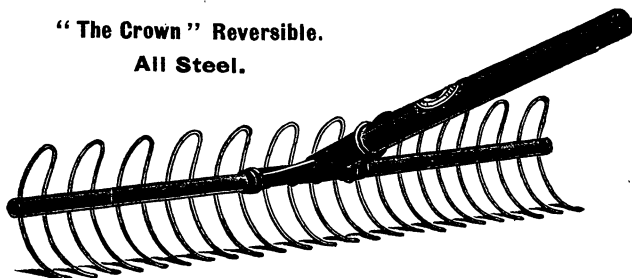
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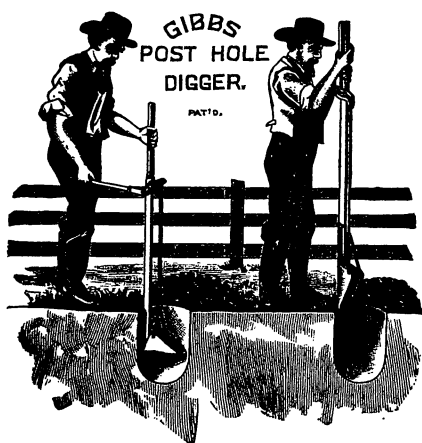
"The Crown" Reversible.
All Steel.



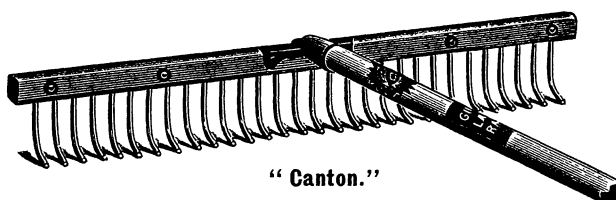
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You will find the line we represent the largest, best and most complete made.

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LEADING JOBBERS
OF HARDWARE.

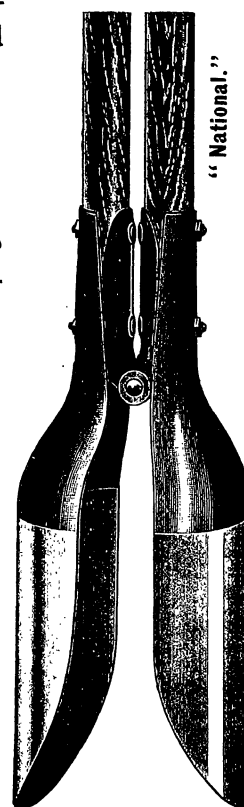
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By **PRINCE ALBERT WRIGHT**, Practical Bookkeeper and Consulting Accountant,
PRICE, \$2.50.

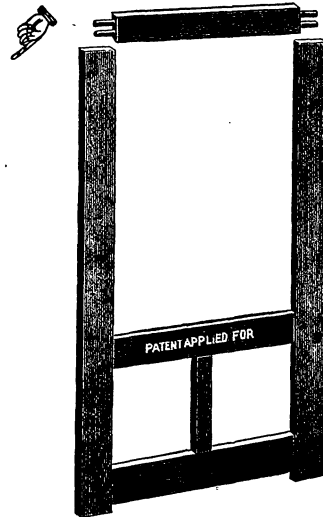
SENT, POSTPAID, ON RECEIPT OF THE PRICE, BY

DAVID WILLIAMS, Publisher and Bookseller, 96-102 Reade St., N.Y.

The Kelley Adjustable Screen Door Frame. Fits Any Door.

Ask Them
for it.

Hibbard, Spencer, Bartlett & Co., Chicago, Ill.
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The Lockwood-Taylor Hdw. Co., Cleveland, O.
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F. C. Ballard, Washington C. H., Ohio.
Smith Bros. Hdw. Co., Columbus, O.
Wolff, Lane & Co., Pittsburgh, Pa.
Bindley Hdw. Co., Pittsburgh, Pa.
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Kilbourne, Jones & Co., Columbus, O.
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The Kruse & Bahlman Co., Cincinnati, O.
Howell Gano & Co., Cincinnati, O.
W. B. Belknap & Co., Louisville, Ky.
Pogue, Miller & Co., Richmond, Ind.
Emmons, Hawkins & Co., Huntington, W. Va.
The Geo. Worthington Co., Cleveland, O.
H. F. Seymour & Co., Rochester, N. Y.
Babcock & Stowell, Binghamton, N. Y.
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Costs less than any other
Adjustable Screen
Door Frame.



(Six in a Bundle for Shipping.)

Any boy can make screen door frame
complete with wire and moulding in
15 minutes.

DESCRIPTION.

The "Kelley" Adjustable Screen Door Frame was gotten up by a practical hardwareman, who long felt the need of something that would fit any size door, and after being made up would be as strong and durable as one with all the panels mortised and tenoned. The frame is made $\frac{3}{8}$ in. or $1\frac{1}{8}$ in. in thickness, and is 8 ft. 6 in. high, and can be cut down to any desired height by simply cutting it off at the top and boring two 5-16 in. holes in the frame on each inner side. The frame can be sprung apart sufficiently to let the dowel pins enter the holes. This can be done without injury to the mortise. The dowel pins are 5-16 in. and made of hard wood. They can be glued in, or a $\frac{3}{4}$ in. wire nail driven through them will do as well, and will be hidden by the moulding. The sides are made 4 inches wide, so they can be dressed down 1 inch off each side, so that a door 3 feet wide will fit anything down to 2 ft. 10 in.; a 2 ft. 10 down to 2 ft. 8., etc. Write for prices and discounts.

The **W. J. Kelley Company,**

(Main Office and Factory),

Greenville, Ohio, U. S. A.

Chicago Office, 945 Rookery,



Hardware Dealers who Believe in Furnishing Decent Goods to Customers Attention !

Do jobbers' salesmen ever say to you : "A Screen Door is a Screen Door?" Probably not. The buyers for certain houses often talk this to manufacturers, however. "It's the *price* we are after. Any of these doors are good enough."

It would scarcely be believed that any intelligent person would buy a flimsy structure of Norway Pine stock about 2 inches wide ; tenons and stiles sticking out in every direction ; paint containing not an ounce of lead nor a drop of linseed oil ; a shabby thing, poorly made from cheap material, when 2 cents more would have bought a good door !

A traveling man once visited "The Largest Screen Door Concern in the World," the manager kindly "showing him around." The visitor noticed that some of the joints would "let a pinch bug through" and made some remark. Said the manager pleasantly : "Yes, that's quite a hole—but the price—the *price* is what brings it together ! These doors go to ——— Hardware Co. and they won't kick !"

Find out what doors are made of before you buy. White Pine costs \$20 to \$25 per thousand. Basswood \$15. Norway Pine \$13.

Good goods, well made from good materials, are to be had for the same prices, for jobbers buying the inferior goods expect to add the 2 cents to their profit !

The Phillips Doors and Window Screens are guaranteed to be well made from good materials.

The better class of jobbers handle them.

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FENTON, MICH.

Cleveland Rubber Co.'s THREE SPECIAL PACKINGS.



Jupiter Packing is constructed on correct Principles, that of placing an elastic cushion as close as practicable to and parallel with the rod, and where it is in some other packing, but actually injures, as the rubber bears directly on the rod, is burned by its heat, and creates friction thereon.



Saturn Sheet Packing is rapidly coming into favor with consumers who look to final results rather than first costs, because a surfeit of the market with inferior packing is causing a reaction. The economy of buying packings having no other merit than cheapness.

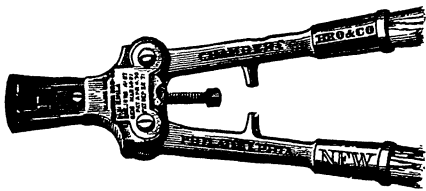


Hyperion Packing is a soft, flexible substance, fitting well to the joints, and when in contact with heat, hardens like iron, and is then not easily affected by grease or oils, and being a non-conductor of heat, lasts longer than any other packing, in steam, hot air, or hot water joints.

WRITE FOR
SAMPLES AND PRICES.

— Agents Wanted in New Territory. —

CLEVELAND RUBBER CO., Cleveland, O.



BOLT & RIVET CLIPPERS

For cutting off the ends of Bolts and Rivets.

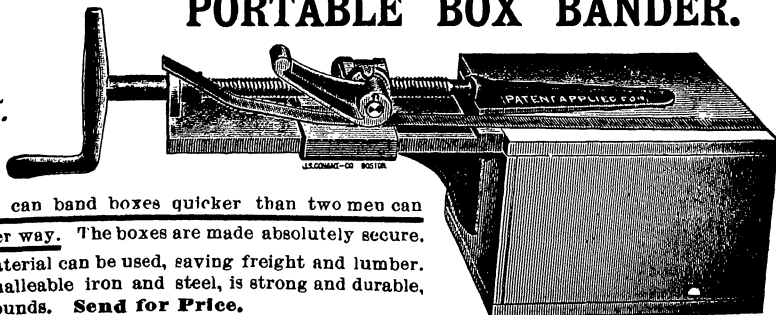
Liberal discounts to the trade.

CHAMBERS BROTHERS COMPANY,

62d St., BELOW LANCASTER, AVE.,
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SOON
PAYS
FOR
ITSELF.

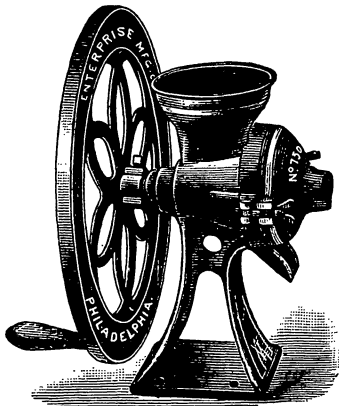
PORTABLE BOX BANDER.



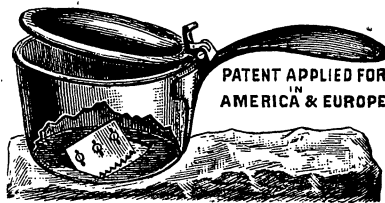
One man can band boxes quicker than two men can in any other way. The boxes are made absolutely secure. Lighter material can be used, saving freight and lumber. Made of malleable iron and steel, is strong and durable, weighs 8 pounds. **Send for Price.**

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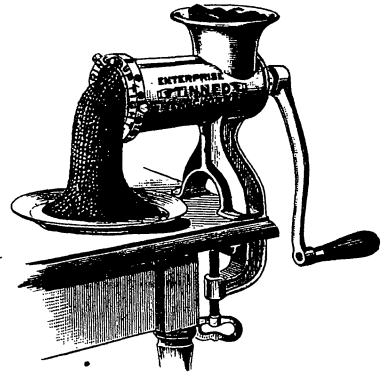
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Philadelphia.**BONE MILL.**

No. 750. \$7.50.

ICE SHREDDER.

TO SHRED OR SHAVE ICE
FOR
Fruits, Drinks, Oysters, Clams,
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MEAT CHOPPER.

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FOR SALE BY THE HARDWARE TRADE. SEND FOR CATALOGUE.**WE ARE STILL "IN IT"**

—WITH THE—

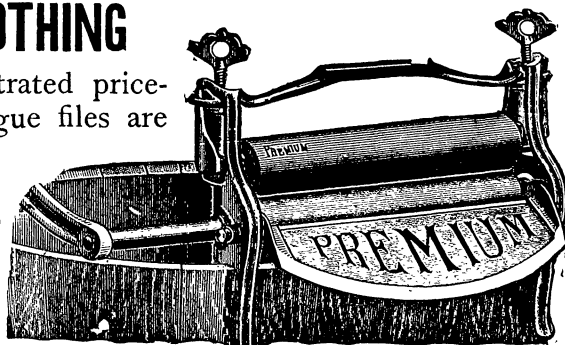
EUREKA AND LEADER

Adjustable Window Screens,

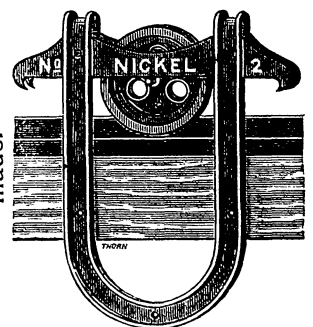
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Sticks and Corners for Door and Window Frames.**SEND FOR CIRCULAR AND PRICE-LIST.****QUEEN ANNE SCREEN CO.,**JNO. H. GRAHAM & CO., Genl. Agents,
113 Chambers St., New York.**Burlington, Vermont.****IT COSTS NOTHING**

to send for our illustrated price-list, and your catalogue files are incomplete without it. Write to the Factory, Montpelier, Vt., or to our Chicago store, 68 Lake St.

**COLBY WRINGER COMPANY.****Nickel Channel Steel Barn Door Hanger.**

Only Channel Steel Hanger made.



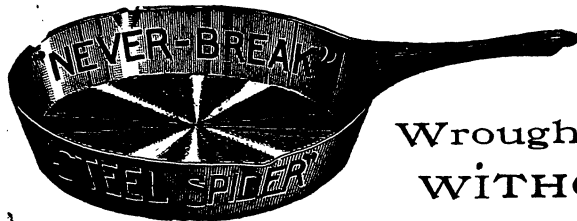
Lath-turned Wheels: will run on all kinds of track.

Largest mfrs. of Hangers in the world.

For catalogues and prices on our Nickel, J. G. C., World's Fair, Morris Covered Hanger and hold-back covered IRON AND STEEL SPRING HINGES, SASH BALANCES, &c address

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"NEVER-BREAK"COLD
HANDLEWrought Steel Spiders
WITHOUT RIVETS.

The handle is made round, fits the hand perfectly and is ALWAYS COOL. The **"NEVER-BREAK"** Spider is the ONLY Wrought Steel Spider manufactured WITHOUT RIVETS complete from ONE PIECE OF METAL.

Wrought Steel Kettles, Griddles, Stew Pans, Stew Pots, Maslins, Scoch Bowls, Hotel Sauce Pans.

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THE BRONSON SUPPLY CO.,
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Made in Two Grades.
PLAINISHED and PLAIN STEEL.

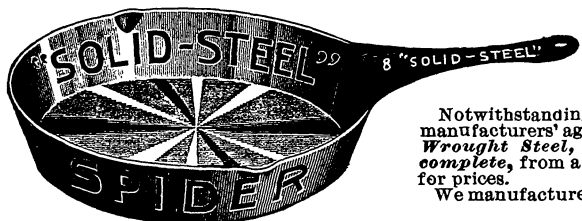
"EXCELSIOR,"
Roasting and Baking Pan.
Seven Sizes.

**The Peerless**

As a freezer and mixer of Cream is the most rapid, thorough and economical of them all. To be appreciated they must be handled. Send for sample order assorted.

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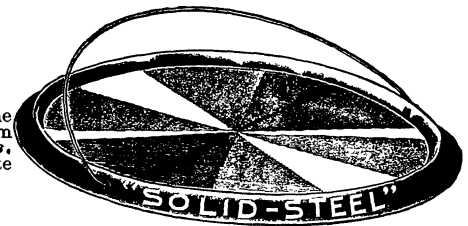
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"SOLID-STEEL" SEAMLESS HOLLOW WARE.

BRILLIANT FINISH.

Notwithstanding the claims made by some manufacturers' agents, our spiders are made from Wrought Steel, Without Seams or Rivets, complete, from a single piece of metal. Write for prices.

We manufacture our own goods.



No Seams, no Rivets in "Solid-Steel" Ware.

All Sizes Balled.

The Cleveland Stamping & Tool Co., Cleveland, O.

We are in shape to figure on light and heavy stamping, and in addition to the above we build Dies and Stamping Machinery.

THE "SURPRISE" SELF-SETTING RAT TRAP. PATENTED.
BEST AND SIMPLEST TRAP IN THE WORLD. A

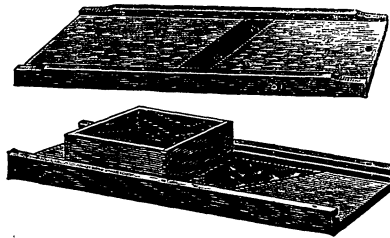
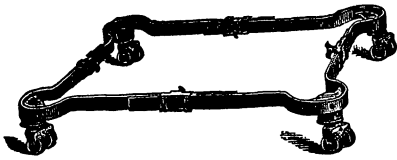
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AUTOMATICALLY SET WITH THE HANDS OR FOOT.
Catches Dollars for the Seller and Rats for the Buyer.
Don't handle infringements.

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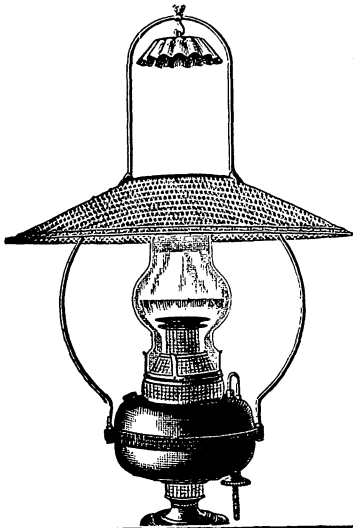
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No. 2 GLOBE INCANDESCENT

A PHENOMENAL 320 CANDLE-POWER COAL OIL LAMP.

THE GREAT STORE, OFFICE AND FACTORY LIGHT.

Brilliantly Illuminates a room 35 feet square at the cost of about one penny per hour.

Save your gas bills. Sold at no higher price than inferior lamps. Made also in handsome designs, with library extensions, for dining rooms, halls, libraries, &c. Sold everywhere. If your dealer does not keep it, write

THE STANDARD LIGHTING CO.,

100 to 118 Perkins Ave.,

Cleveland, Ohio.

**C. W. DUNLAP,**

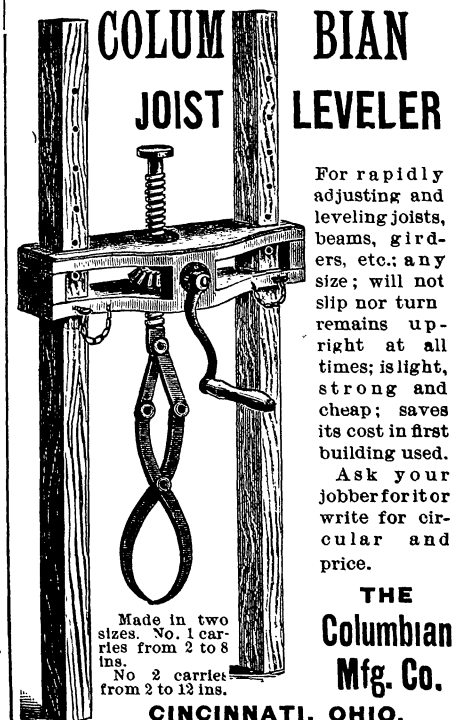
MANUFACTURER OF A LARGE VARIETY OF SUPERIOR QUALITY HOUSEKEEPER'S
HARDWARE AND GARDEN TOOLS.
ILLUSTRATED CATALOGUE AND PRICE LISTS TO TRADE.
P. O. ADDRESS . . . BOX 2703 NEW YORK.

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Manufacturers of

All Kinds of Tinware and Sheet
Metal Goods.

N. Y. Office and Salesroom, 104 & 106 John St.
Factory, 103 to 119 N. 3d St., Brooklyn, E. D., N. Y.



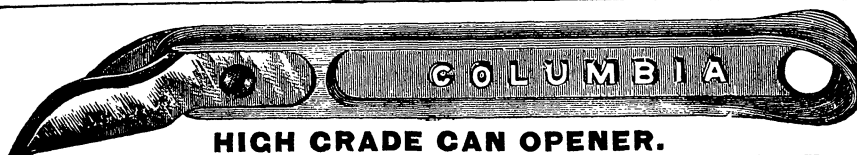
Made in two
sizes. No. 1 car-
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ins.
No. 2 carries
from 2 to 12 ins.

For rapidly
adjusting and
leveling joists,
beams, gird-
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size; will not
slip nor turn
remains up-
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times; is light,
strong and
cheap; saves
its cost in first
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Ask your
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Mfg. Co.**

CINCINNATI, OHIO.
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**HIGH GRADE CAN OPENER.****A. F. Meisselbach & Bro., Mfrs., Newark, N. J.**

—ALL JOBBERS.—

The Practical Polish and Varnish Maker.
By H. C. STANDAGE. A treatise containing 750 re-
ceipts and formulae for the manufacture of var-
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The best in the world. The cheapest. The handsomest and most convenient culinary utensil ever invented. All live dealers sell it.

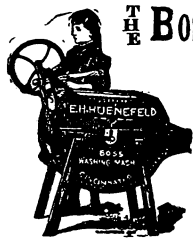
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HOLLOW WARE and HARD
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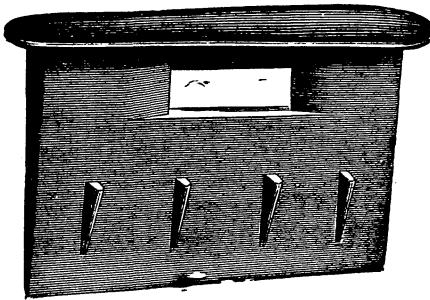
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PHILADELPHIA, PA., U. S. A.



THE BOSS Washing Mch.

An Entirely New Invention.
Double acting, working with
two cylinders in opposite
directions. The greatest
saver of household labor
ever invented.

E. H. HUENEFELD,
CINCINNATI, O.
Send for Circular.



I still manufacture and sell the above
Axe Wedge, which has more practical
merit than any other thus far made.

F. V. WOOSTER,
66 BEVERLY ST., BOSTON.

ACME CUTTING TOOLS.

Made in all Sizes.

**SOLID STEEL ACME PLIER
AND WIRE CUTTER.**
Made with cutters of best steel.

ACME CUTTING NIPPER.
Jaws of Choicest Tool Steel, dove-
tailed into the head, making it as
strong as solid steel.



HIGGANUM HARDWARE CO., HIGGANUM, CONN.

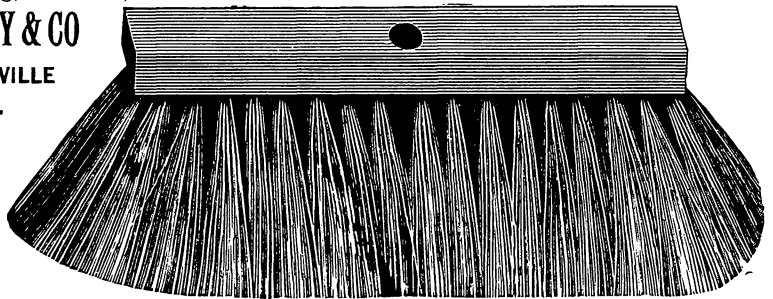
New York Office, 18 Cliff Street.

PUSH BROOMS of every description, Rattan, Steel Wire and Bass, for
all uses. Stable, Street, Bloom, Chill, Frog Switch,
shop and scrubbing work. Brooms for heavy and light work. Brushes of all kinds
for Casting, Moulders, Mill and special uses, &c., &c., made by

JOS. LAY & CO

RIDGEVILLE
IND.

Send for
Catalogue
and
prices.



It Won't Wash.

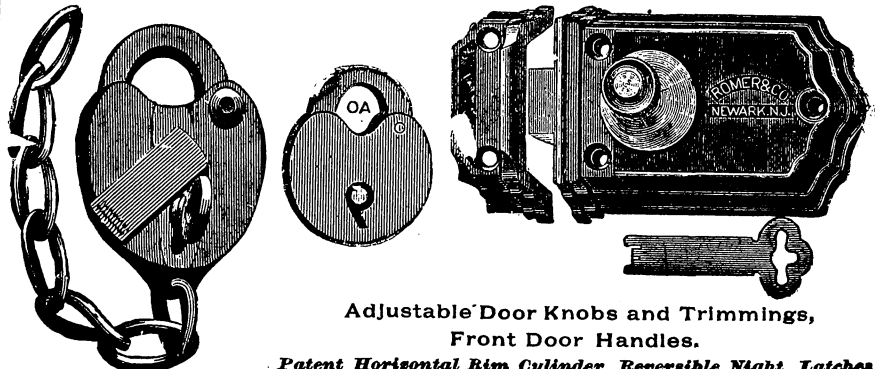
"The Anthony Wayne"



Won't wash your face,
crockery, buggy, but if a
dealer sells it to wash
clothes that's what it's
made for. You can de-
pend on it to do so, both
thoroughly, quickly and
without tearing the
clothes. Write or order
sample machine.

THE ANTHONY WAYNE MFG. CO.,
FORT WAYNE, IND.

ROMER & COMPANY, Manufacturers of PATENT
JAIL LOCKS, BRASS and IRON PADLOCKS,



Adjustable Door Knobs and Trimmings,
Front Door Handles.

Patent Horizontal Rim Cylinder Reversible Night Latches.

Illustrated Lists sent to the Trade on application.

275, 277 and 279 Passaic St., near Erie and D. L. & W. R. R. Depots, Newark, N. J

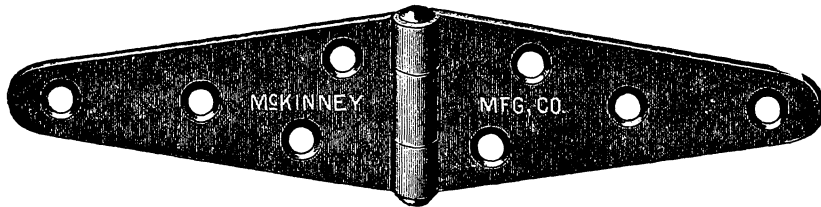
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— WE MANUFACTURE —

STEEL HINGES AND BUTTS

EXCLUSIVELY.

SEND FOR
LIST.



ORDERS FILLED
ON SIGHT.

"NONE BETTER."

ICE PICKS



The "Copeland Pick."

Polished Jet Handles.

Superior in Every Way.

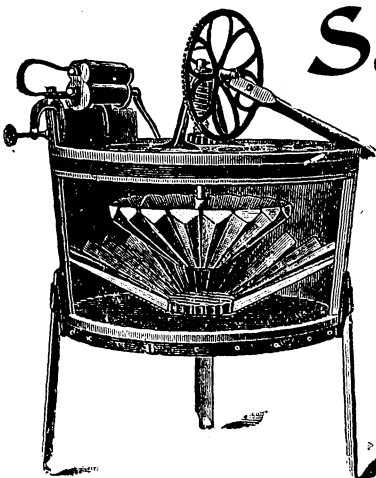
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Invited

To Ask for Prices.

The Copeland Hardware Mfg. Co.

WORCESTER, MASS.

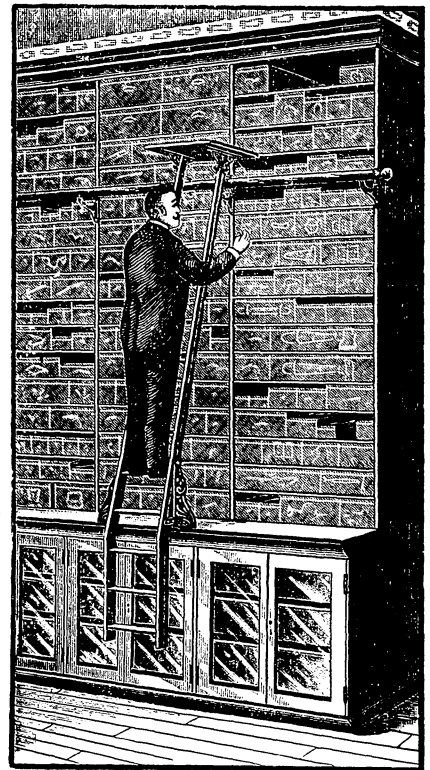


Satisfaction

in washing clothes can only be secured by the use of a practical machine. Such is "THE WEISELL." Dealers should consider merit and quality before buying rather than price. Try the "Weisell." Write

DIETHER & BARROWS,

Ft. Wayne, Ind.



THE BICYCLE STEP LADDER.

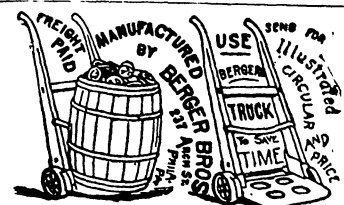
The Newest, Neatest, Simplest, Easiest Operated and Safest Store Ladder made.

Ladders are not Suspended, but Supported from below on wheels. Move easier with operator on than others when empty. Highly finished, and very handsome. Made in different grades and prices to suit.

Send for illustrated catalogue and prices to

The Bicycle Step Ladder Co.,

184 and 186 Clark St., Chicago, Ill.

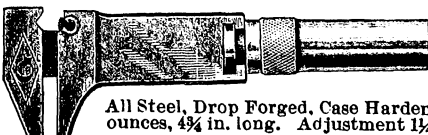


COMMON MOUSE TRAPS
BEST FOR USE!

Ripley Mfg. Co., Unionville, Conn.



Porcelain-Lined Lemon Squeezers, Steak Hammers, Boot Jacks, Magnetic Tack Hammers, Mallets, Bung-Starts, Hand Screws, Beacon Hill Pat. Mouse Traps, Sunny-Side 2 lb. Lap Board.



Manufactured
by the

GENDRON IRON WHEEL CO.,

Diamond  Cycle Wrench,

WITH SPOKE GRIP ATTACHMENT.

All Steel, Drop Forged, Case Hardened. Lightest, neatest and strongest. Weighs 5½ ounces, 4¾ in. long. Adjustment 1¼ in. Write for prices and descriptive circular.

Sold by all Cycle and Hardware Dealers.

TOLEDO.

Tempora mutantur et nos mutamur in illis.

*Excel
in
Lightness
and
Strength,
in
Beauty
of
Design
and
Novelty
of
Finish.*

Wrought

Steel

Door

Locks.

*Being
Made
From
Wrought
Metal,
are
Uniform
in
Size
and
Exact
in
Measure-
ment.*

RUSSELL & ERWIN MFG. CO.

SOLE MANUFACTURERS,

NEW BRITAIN, CONN.

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BALTIMORE.

LONDON.

FINE BUILDERS'

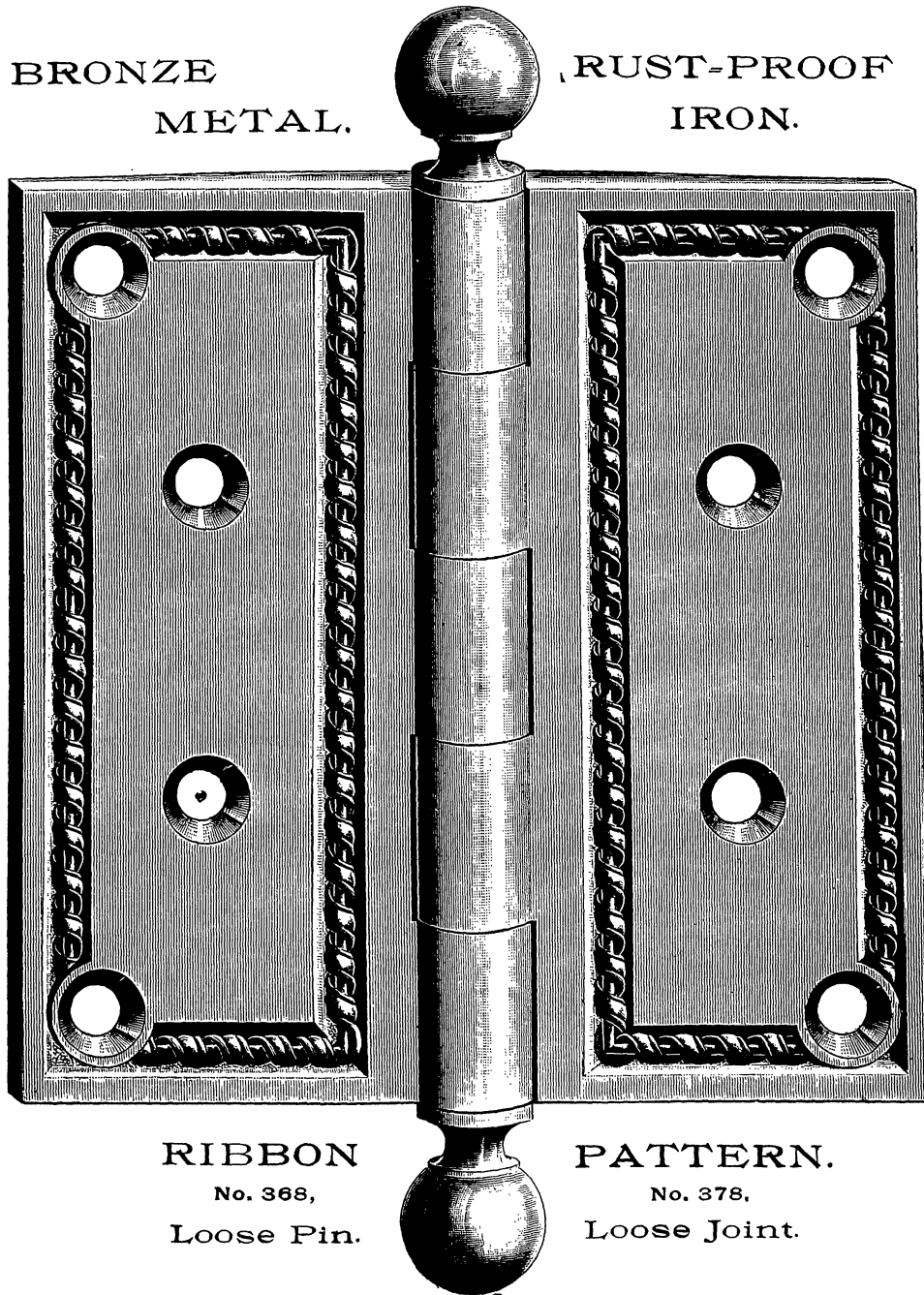
COMPLETE
LINES.

HARDWARE.

A Variety of Designs and All Finishes.

"VASSAR" CYLINDER LOCKS AND LATCHES

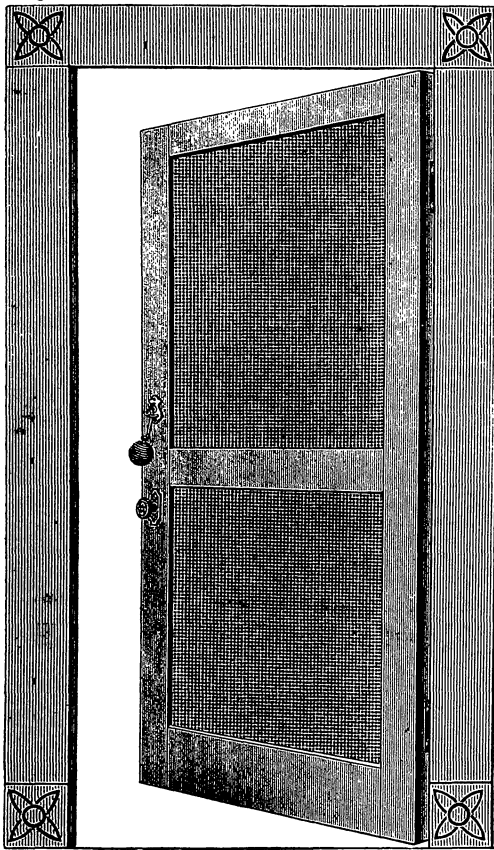
A SPECIALTY.

ARTISTIC DESIGNS. CATALOGUE FURNISHED
UPON APPLICATION.

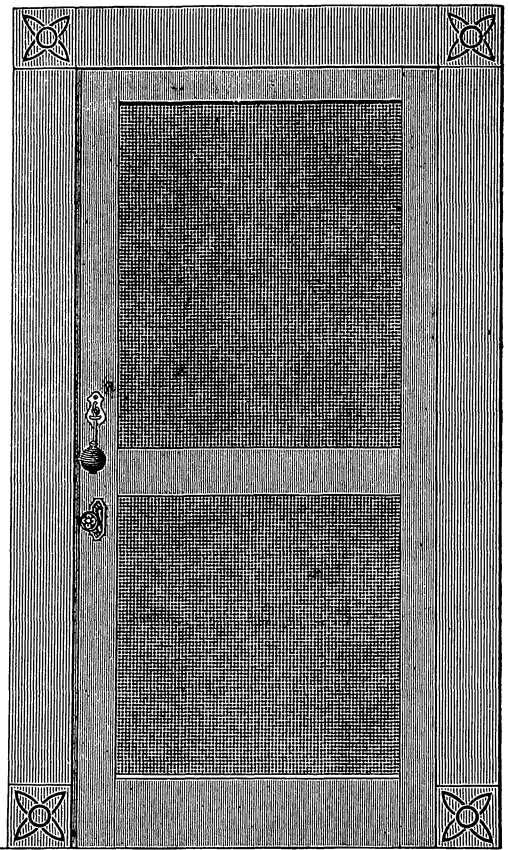
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READING HARDWARE COMPANY,
READING. PA.WAREHOUSES: NEW YORK,
81 Reade Street.PHILADELPHIA,
514 Commerce Street.CHICAGO,
73 Wabash Avenue.

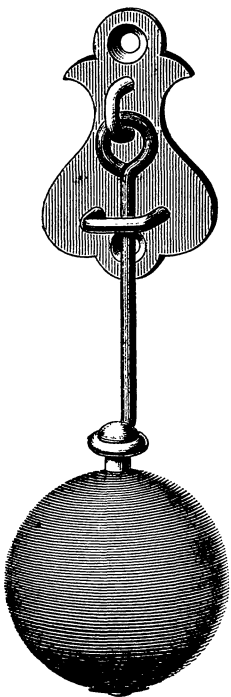
"NO-SLAM" Patent Screen Door Checks.



Showing the Door Closing.



Showing the Door Closed and the proper position for placing the Check.



This cut is about two-thirds size.

SIMPLE,

DURABLE,

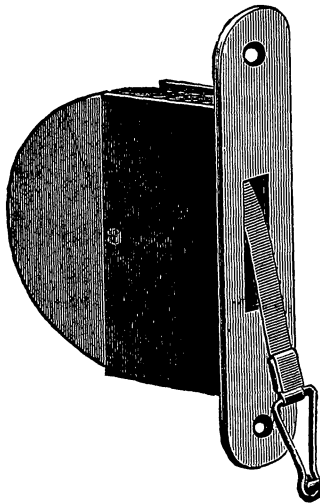
EFFECTIVE.

The "No-Slam" is an Automatic Check for Screen and other light doors which can be applied in connection with any Door Spring or Spring Hinge. It has a Solid Rubber Ball, Nickel-Plated Trimmings, and is a durable Check which will not rack the door. Packed with simple directions for applying; complete with Screws.

— Manufactured by —

SARGENT & CO., New Haven, Conn., and New York.

SOLD BY ALL HARDWARE DEALERS.



SIDE BALANCE.

Pullman Steel Frame Sash Balance.

WE MAKE STRONG CLAIMS.

Having passed the experimental mark, there is no guessing at what we have got.

**They Are a Necessity,
IMPROVING AND FACILITATING CONSTRUCTION.**

Much superior to bungling Cast Iron Weights and Cord. Warranted 15 years. Require no Box Frames.

By doing away with box frames you remove the communicative part of a building in case of fire, besides making a much more substantial frame. Can be applied to old as well as new work, exactly counterbalancing the weight of sash. Endorsed by leading Architects and R. R. Companies.

PULLMAN WROUGHT STEEL SPRING HINGE.

Don't buy light cast iron, when we can sell you a Hinge 100 per cent. more durable and cost less money.

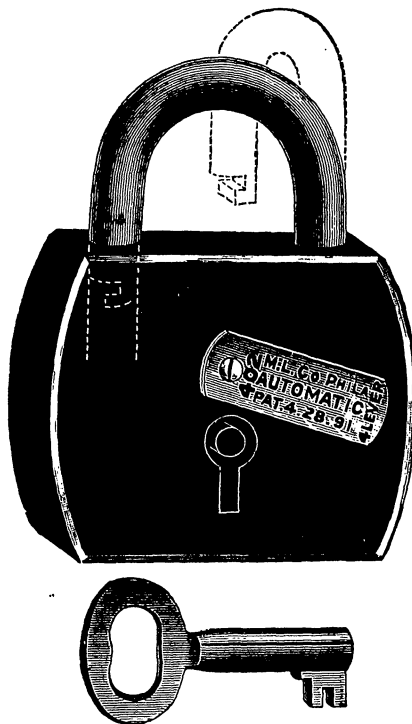
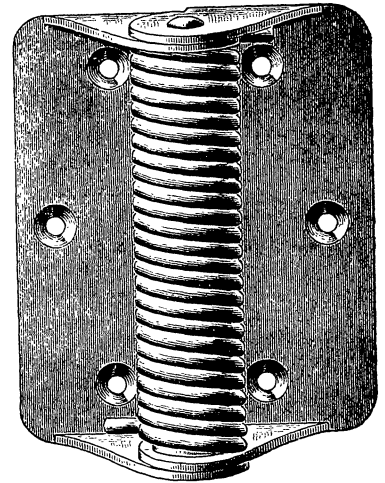
We make only one size, 3 x 2½ inch, japanned.

Write for our prices.

Pullman Sash Balance Co.,

ROCHESTER, N. Y.

NEW YORK OFFICE, 142 Chambers St., ROBLEY & BRUNDAGE.



NEW PATENT 4-LEVER

Automatic Padlock.

Our recommendation of the "AUTOMATIC" Padlock as one that would claim a prominent place in the market has been fully warranted by the universal satisfaction it has given.

We now, with equal emphasis, recommend the smaller size. Every part is well made, of the best materials, and the finish is excellent. These Locks are of a design, weight and size that adapt them to an unusually wide range of service.

The cuts show full size. The larger weighs full 4 ounces; the smaller full 1 ounce. The 4 Levers afford a degree of security unprecedented in locks of such moderate price. Over 200 changes of key are available in the larger, and over 100 in the smaller lock. The automatic action is pleasing, novel and convenient.



When made special, to pass a sample key, also when made with keys alike to pass, and as well when more than 50 changes are required in a set, the price per dozen locks is advanced 50 cents net.

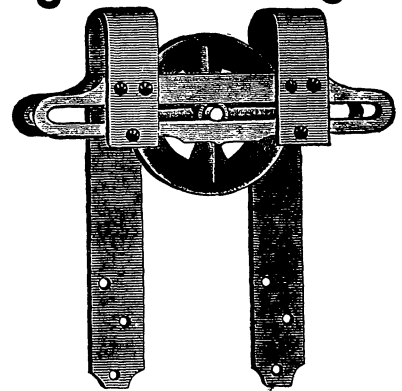
No. 402, Steel, dark finish, 2-keyed,
" 402B, Brass, bright finish, 2-keyed,
" 400, " Nickel plated, 1-keyed,
" 398, " Bright finish, 1-keyed,

Per Dozen, \$6.67
" 8.00
" 6.80
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CHICAGO Big Twin Hanger.



Also a Complete Line of this
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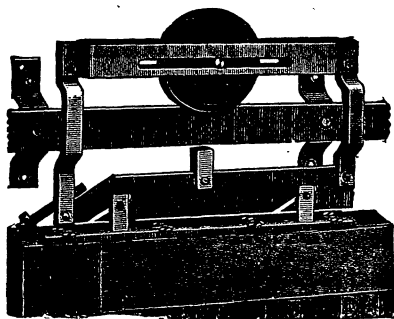
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More nearly Noiseless than any other.
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No cutting of doors.
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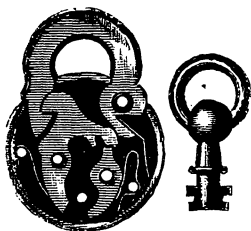
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Sizes; $\frac{1}{4}$ inch to $2\frac{1}{2}$ inches; of cast bronze. Defies competition for quality and price. No steel or iron used, cannot rust, and cannot be picked. Also, $\frac{1}{2}$ and $\frac{3}{4}$ inch Padlocks, opened with a common pin, in brass and nickel, for cats and small dogs. The best Railroad Switch and Car Lock in the world. Adopted by the United States Treasury for bonded warehouses.

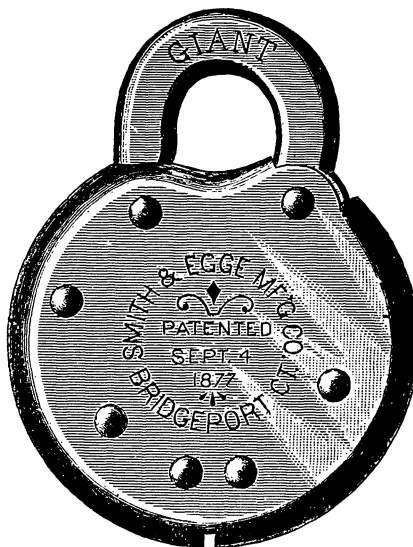
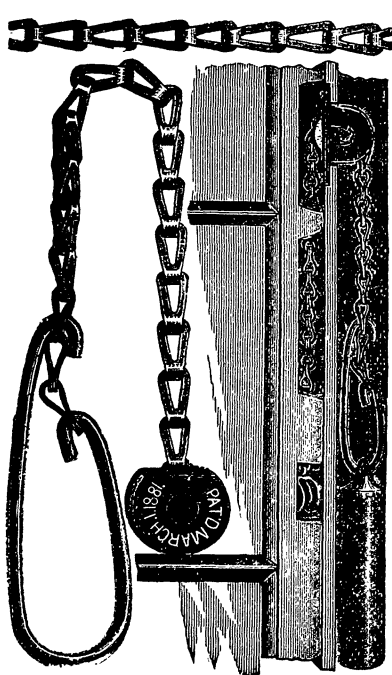
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is a substitute for cord in hanging weights to windows. It is manufactured by us only, and by automatic machinery, patented and owned exclusively by ourselves, and whereby we secure uniformity of construction and quality. We have been to great expense in producing a metal having all the qualities and conditions requisite for making suitable chain for this purpose, and to prevent other chain of the same pattern of link and of the same general appearance, but made from an inferior metal, being offered as the same thing, we patented the word "Giant" as a Trade-Mark, as applied to either metal or chain. Trade-Mark Registered April 16, 1878, and October 22, 1878, and our metal is therefore known in the market as "Giant Metal," and our chain as "Giant Metal Sash Chain."

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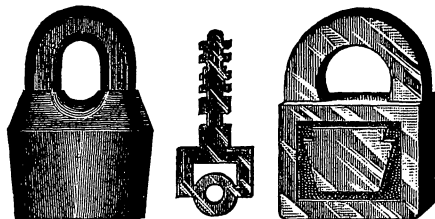
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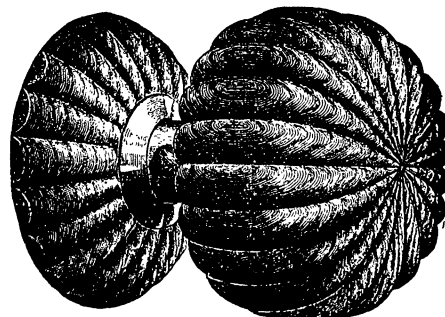
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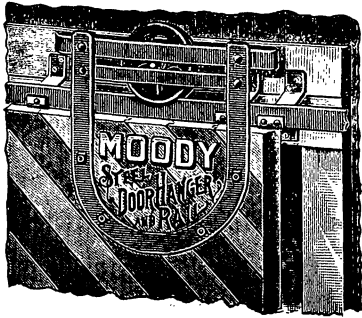
SASH WEIGHTS

E. E. BROWN & CO.,

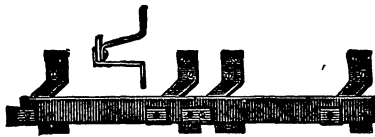
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VICTOR MFG. CO., Newburyport, Mass.

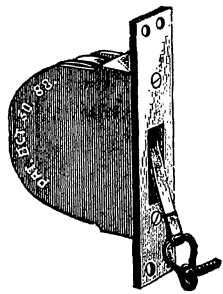
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Showing one-half set of hangers attached to door.



The Only Bracing Bracket Made.

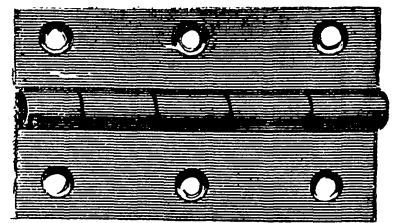
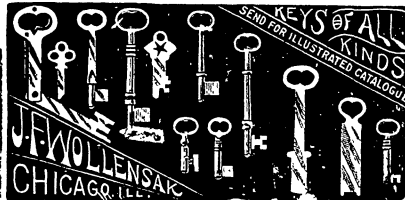
HANGERS.	PRICE-LIST.	Per Doz. pra.
No. 5, to run 6 feet, 3 1/4 in. wheel,	-	\$10.00
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RAIL, per foot.....		6 1/2 cents.

**Merit Always Wins.****THE CALDWELL SASH BALANCE**

Has been the standard for five years.
Write for our new catalogue of Hardware Specialties.

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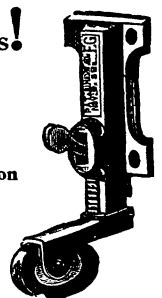
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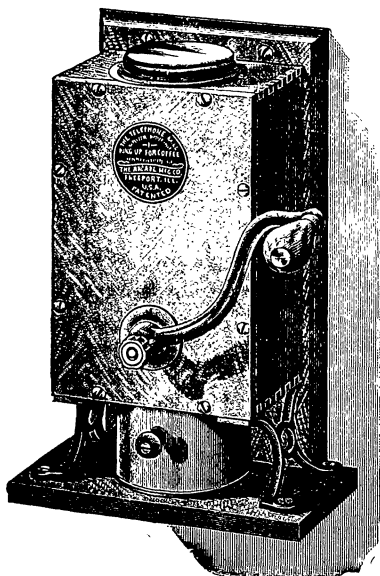
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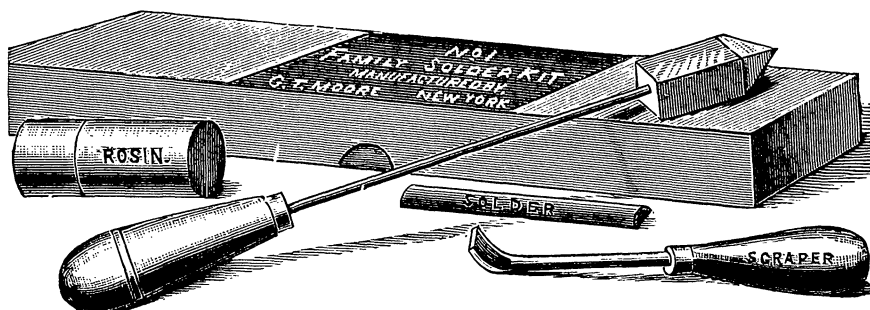
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Sample pair sent to any hardware or saddlery firm by addressing

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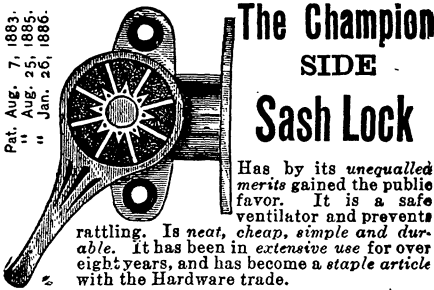
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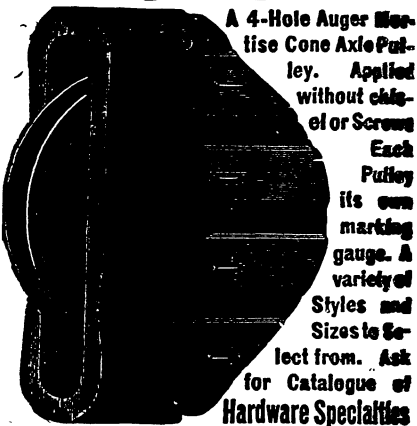
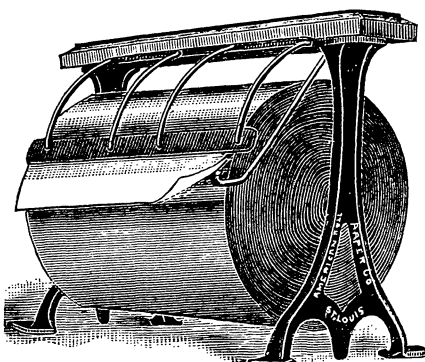
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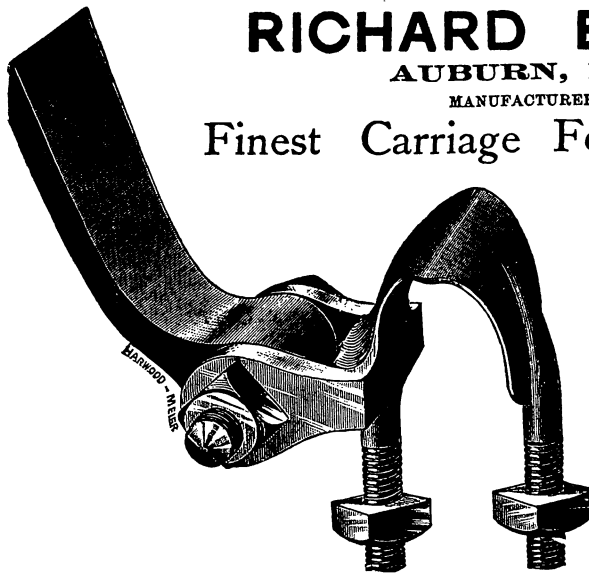
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SIDE
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Each
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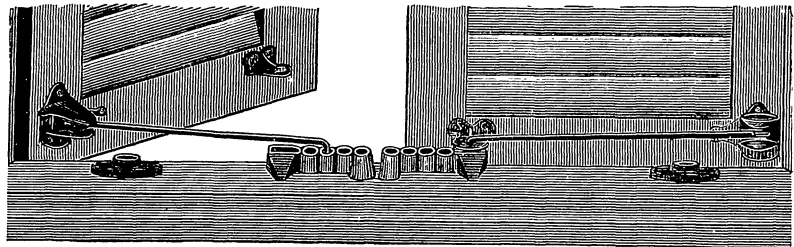
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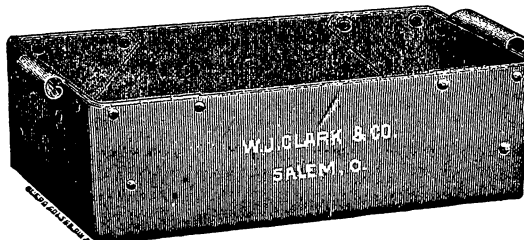
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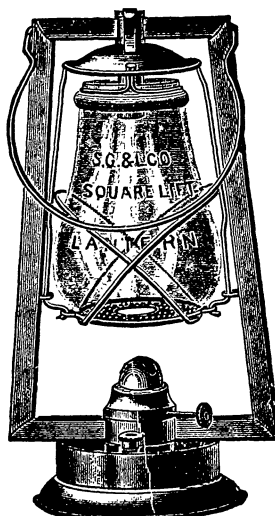
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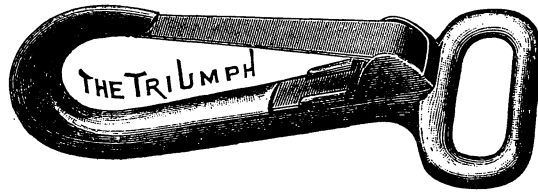
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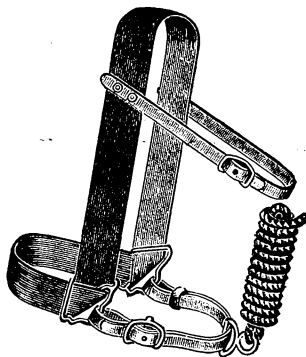
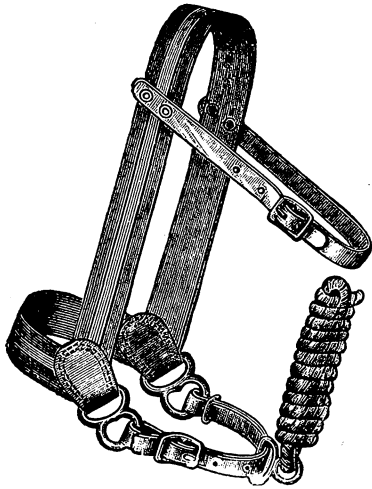
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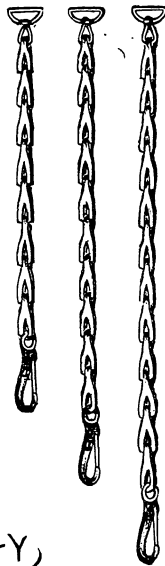
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Tie.



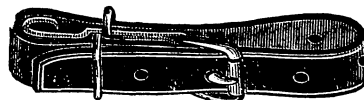
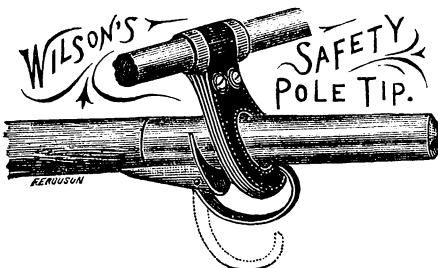
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Cattle Tie.



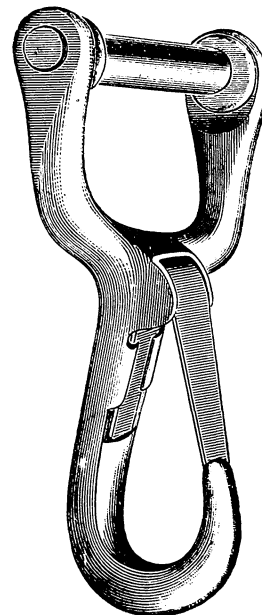
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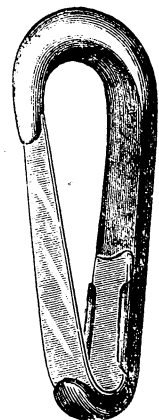
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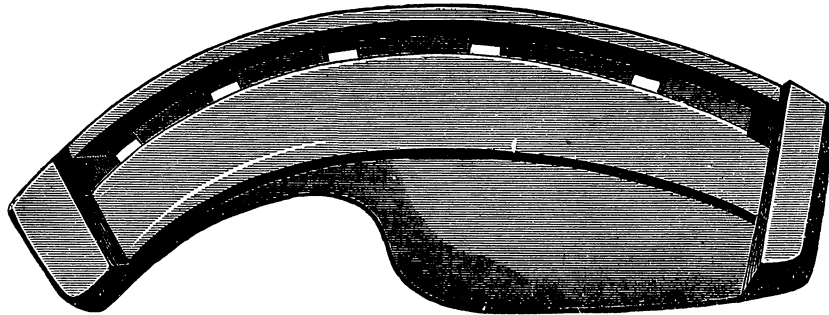
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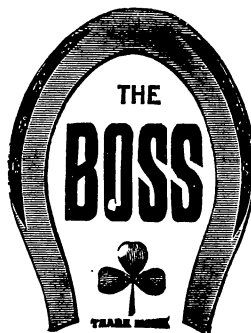
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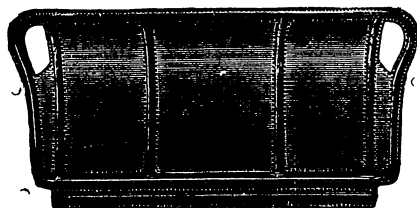
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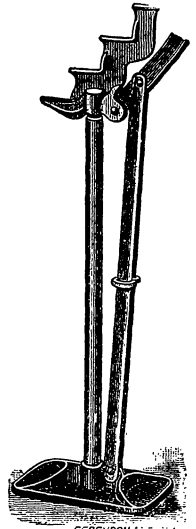
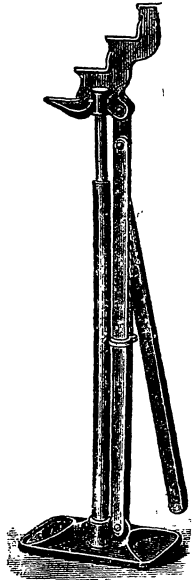
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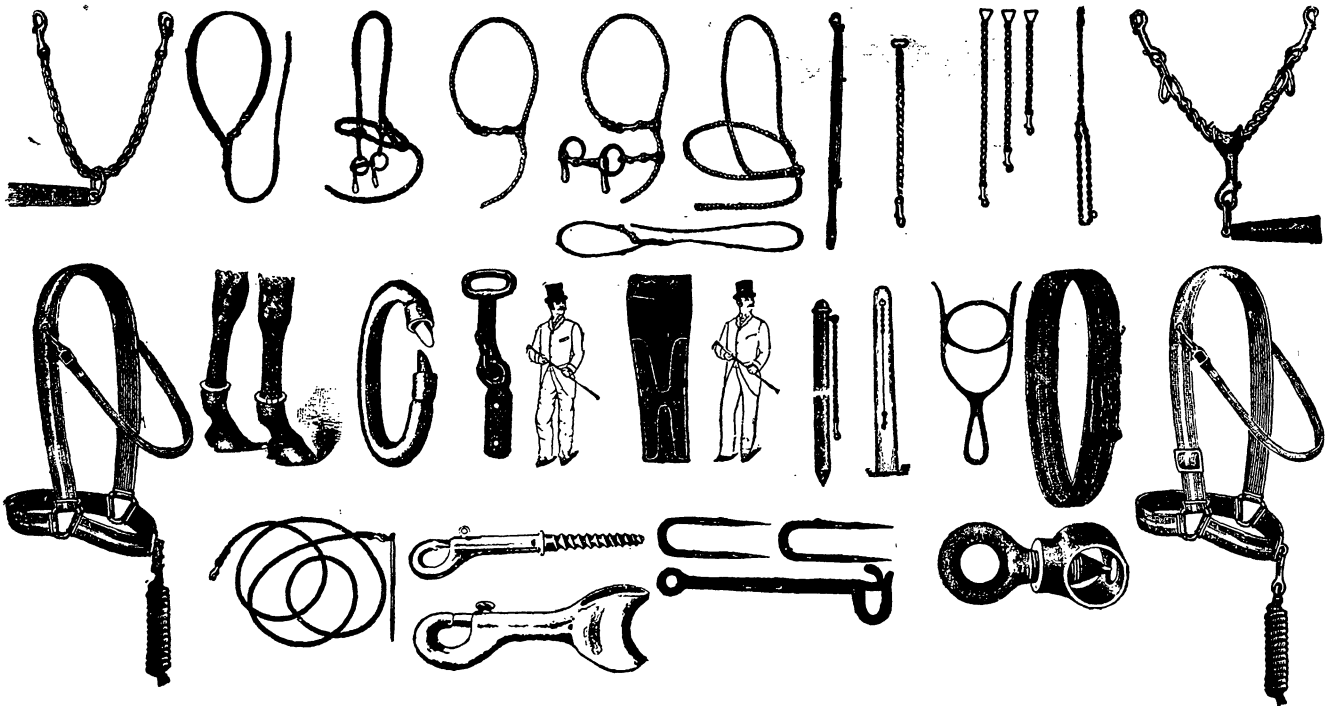
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COVERT'S

Horse and Mule Jewelry.



Covert's Celebrated Harness Snaps, Chain and Web Goods, Hardware and Saddlery Specialties are sold by all leading jobbers at manufacturers' prices.

COVERT MFG. CO.,

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WHY USE WOODEN OR HEAVY STEEL BLOCKS WHEN THE STEEL AND IRON TACKLE BLOCKS



—MADE BY—
The Cleveland Block Co.

CLEVELAND, OHIO, U. S. A.,

ARE BETTER IN EVERY WAY.

No waste material. Every ounce of weight in the line of strength. No clumsy outside straps or bolts. As light as wooden blocks and vastly more durable. They wear, but never break. Sheaves interchangeable.

General Agents: Topping Brothers, 92 Chambers Street, New York.
The H. Channon Co., 22 Market Street, Chicago.
New England Agents, - Dodge, Haley & Co., 212 High Street, Boston

NOW IS THE TIME TO PLACE YOUR ORDERS FOR HAY BLOCKS.

Our Self-Oiling Blocks

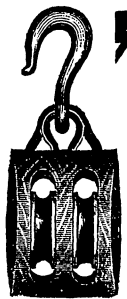
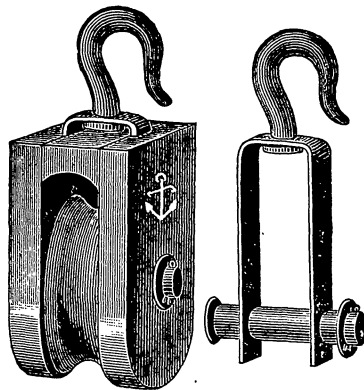
are the best for the least money. They have hard wood shells; wrought iron straps; forged steel hooks and hollow wrought iron axles perforated.

MANUFACTURED BY

Boston & Lockport Block Co.,

LOCKPORT, N. Y., BOSTON, MASS.

H. B. NEWHALL CO., 105 Chambers St., N. Y. } Agts.
C. H. GURNEY CO., Chicago, Ill.

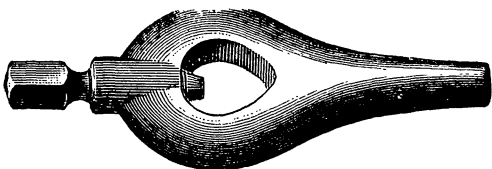


'S STEEL. WOOD OR IRON

MADE BY
TOLEDO BLOCK WORKS,
511-513-515 Water St., TOLEDO, OHIO,
WILL PROVE SATISFACTORY
TO USER.
J. C. McCARTY & CO., Gen'l Agents, 97 Chambers St., New York.

LE COUNT'S STRAIGHT TAIL DOG, WITH STEEL SCREWS.

U. S. Standard, and the points hardened. To be driven from a stud in the face plate. It is from the same pattern as the Heavy Steel Dog, and warranted, like that, not to break with any work.



No.	Inch.	Price.	No.	Inch.	Price.
1.....	3/4.....	\$9 60	11.....	1/2.....	\$1 45
2.....	1.....	70	12.....	3/4.....	1 60
3.....	1 1/4.....	80	13.....	1.....	1 80
4.....	1 1/2.....	80	14.....	1 1/4.....	2 10
5.....	1 3/4.....	80	15.....	1 1/2.....	2 75
6.....	1 7/8.....	95	16.....	1 3/4.....	3 25
7.....	2.....	95	17.....	2.....	4 00
8.....	2 1/4.....	1 10	18.....	2 1/4.....	5 00
9.....	2 1/2.....	1 20	19.....	2 1/2.....	5 00
10.....	2 3/4.....	1 30	20.....	3.....	7 00

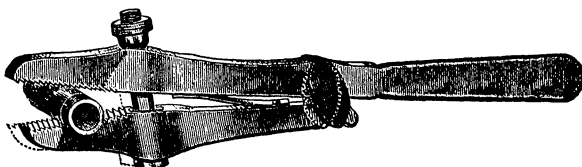
One set to 2 inch, \$7.80. Full set, \$14.10

This pattern will stand much more than a bent tail, and some prefer them on account of their direct action on the work.

SEND FOR CATALOGUE OF FULL LINE OF MACHINISTS' TOOLS.

C. W. LE COUNT, MANUFACTURER, SO, NORWALK CONN., U. S. A
These goods are for sale by CHAS. CHURCHILL & CO., Ltd., 21 Cross St., London, England.

THE "CURTIS" WRENCH.



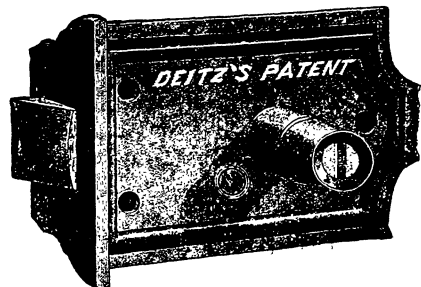
Patented April 8, 1890.

The most Effective, Reliable and Perfect Wrench in the market.

—MANUFACTURED ONLY BY—

AMERICAN SAW CO., Trenton, N. J.
SEND FOR CATALOGUE

A. E. DEITZ



No. 109 Latch.

J. C. McCARTY & CO., Agents,
97 Chambers and 81 Reade Sts., New York.

Factory, BROOKLYN, E. D., N. Y.

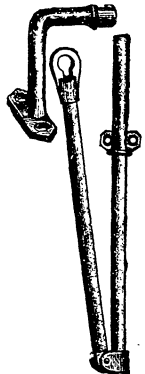
Transom...Lifters

OLD RELIABLE

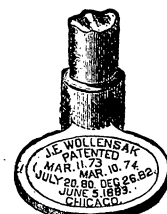
J. F. WOLLENSAK'S PATENT.

CLASS 3.

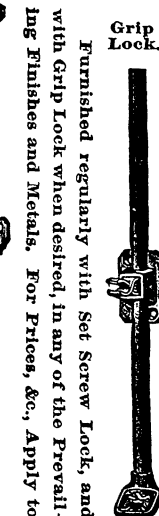
CLASS 4.



CAUTION!



THIS CUT IS A FAC-SIMILE OF THE STYLE OF HANDLE AND MARKS USED ON ALL OUR CLASS 3 AND CLASS 4 LIFTERS.



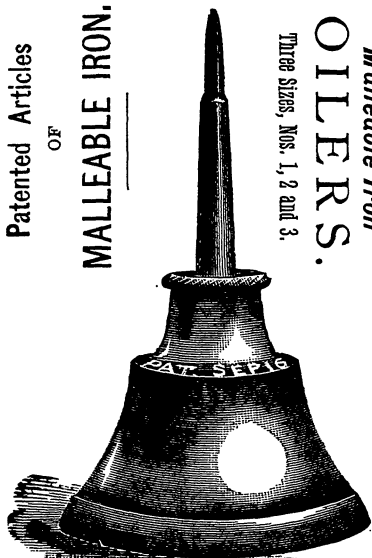
J. F. WOLLENSAK, CHICAGO, ILL.

The Phonograph and How to Construct It.
With a chapter on sound. By W. GILBERT. Deals with the construction of the phonograph in such a plain manner that the student will clearly understand its construction. A complete set of drawings to scale of the various parts of the phonograph accompany the book. 87 pages, illustrated, 12mo. cloth\$2.00
or Sale by DAVID WILLIAMS, 96-102 Reade St., N. Y.

BUFFALO SCALE CO., Buffalo, N. Y. SCALES OF ALL KINDS.

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OF
MALLEABLE IRON.

Oilers.
Malleable Iron
PATENT
Three Sizes, Nos. 1, 2 and 3.



Hammer's Adjustable Clamps.
Mall. Iron Hand Lamps.
M. I. Hanging Lamps.

New Pattern Heavy Screw Clamps.
Strongest in the market.

For Sale by all the Principal Hardware Dealers.
SEND FOR PRICE LIST.
MALLEABLE IRON CASTINGS
of superior quality, and Hardware Specialties
in Malleable Iron, made to order.

HAMMER & CO., Branford, Conn.

HOWARD IRON WORKS
BUFFALO, N. Y.
Manufacturers of

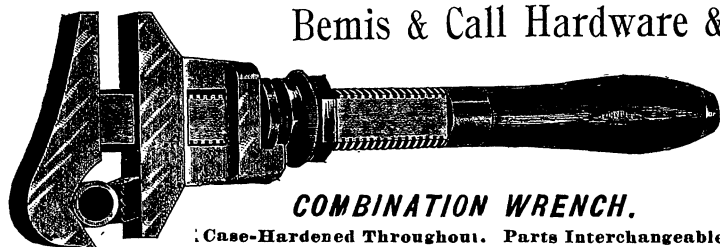
BENCH VISES.

Price Lists sent on application



INTERCHANGEABLE
LOCK-CORNER SHELF BOXES.
Screw Cases, &c.
FOR THE HARDWARE TRADE
A. H. GREEN,
22 Park Place, New York.

IF YOU WANT THE BEST
NICKEL SILVER SPOONS
FORKS & C.
BOARDMAN & SON,
THEIR MAKE IS EQUAL TO ANY OTHER
TO ANY OTHER
HARTFORD, CONN.
HARTFORD, CONN. SINCE 1840.

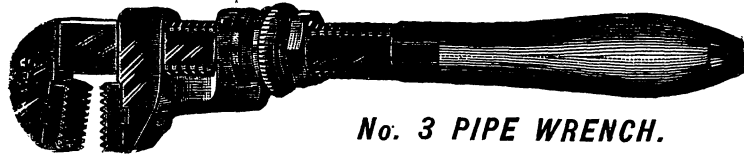


Bemis & Call Hardware & Tool Co

COMBINATION WRENCH.

Case-Hardened Throughout. Parts Interchangeable.

This wrench not only combines the superior qualities of a Gas Pipe Wrench, but also all the requisite combinations of a regular Nut Wrench, thus making a combination which has no equal.



No. 3 PIPE WRENCH.

The serrated jaws of the Wrench are interchangeable; that is, the same serrated plate may be used for either the stationary or sliding jaw, so that if one plate is broken another can be furnished adapted to either jaw without express designation. The slides, nuts and various parts are also interchangeable, thus easily repairing the Wrench at very small expense, and with as perfect practicability for further use as when the Wrench was new.

For Circulars and Price-List address.

BEMIS & CALL HARDWARE & TOOL CO., Springfield, Mass., U. S. A.



TRIMO PIPE WRENCH,

Forged Steel.

All parts interchangeable.

Grips firmly without loss of motion. Releases readily. Never locks. Causes no trouble in close quarters. Does not crush the pipe.

TRIMO

CHAIN
PIPE

WRENCH.



TRIMO
BASIN WRENCH.

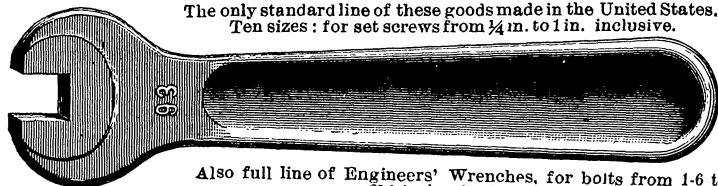
Superior in strength and ease of operation.
COMPLETE circular grip. Never slips nor crushes.

Can be used with one hand and in closer quarters than any other Basin Wrench. Parts interchangeable.

TRIMONT MFG. CO., ROXBURY, MASS.

DROP-FORGED STEEL SET-SCREW WRENCHES.

The only standard line of these goods made in the United States.
Ten sizes: for set screws from 1/4 in. to 1 in. inclusive.



Also full line of Engineers' Wrenches, for bolts from 1-6 to 2 3/4 inches inclusive.

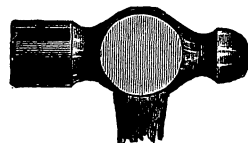
J. H. WILLIAMS & CO.,

9 to 15 RICHARDS ST.,

—MANUFACTURERS OF—

BROOKLYN,

Brock's Patent Drop-Forged Chain Pipe Wrench,
and Lathe Dogs, Collars, Thumbscrews and special Drop-Forgings of every description, from Iron, Steel, Copper and Bronze.



BILLINGS' BALL PENE MACHINIST'S HAMMER.

DROP FORGED FROM BEST TOOL STEEL.

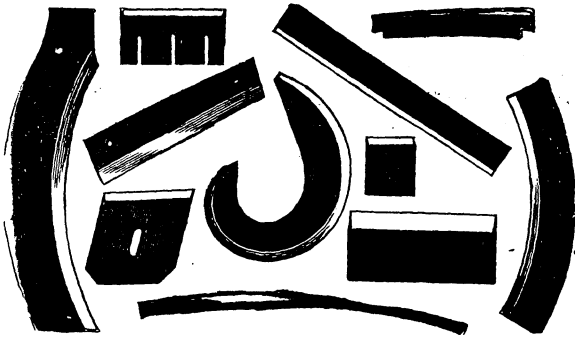
SUPERIOR TO ALL OTHERS IN DESIGN,

MATERIAL, TEMPER AND FINISH.

THE BILLINGS & SPENCER CO.

HARTFORD, CONN.

London House: Chas. Churchill & Co., 21 Cross St., Finsbury.

**LORING COES & CO.**

WORCESTER, MASS.,

Manufacturers of MACHINE KNIVES.

Shear Blades and Strips, Moulding Cutter Plate, Die Stock for Leather, Cloth and Paper Cutting Dies. Lawn Mower and Hay Cutter Knives of every description

End view of Plated Stock for Dies, Lawn Mower Knives, Blades &c., showing how the Steel is laid.

**THE IMPROVED ACME STEEL WRENCH**

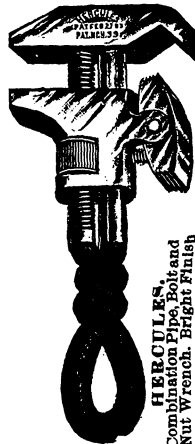
PATENTED.

CAPITOL MFG. CO.,

Cable Address: "CAPITOL, CHICAGO,"

125 to 137 REES STREET,
CHICAGO, ILL., U. S. A.

Awarded Prize Medal at Paris Exposition and Jamaica Exposition

ACME.
Standard Bright
Finish.HERCULES
Combines Pipe and
Nut Wrench. Bright Finish

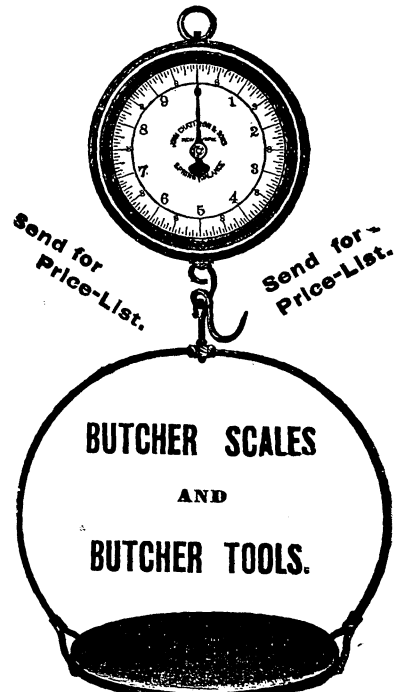
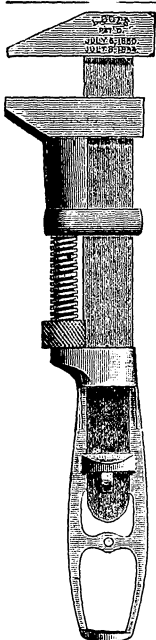
The Hercules Screw Driver and Tack Claw (Patented).

This Screw Driver is made from one piece of special cast steel, in all sizes, from 1 1/4 in. to 12 in. The blade is well polished, carefully tempered, and every screw driver is subjected to a severe test and warranted. Handles Japanned with the best quality baking Japan.

The Strongest and Most Durable Wrench and Screw Driver Made.

Write for Prices and Full Information.

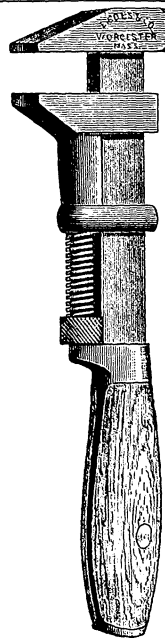
HARMON & DIXON, 118 Chambers St., New York, N. Y., Eastern and Export Agents.

Send for
Price-List.Send for
Price-List.**JOHN CHATILLON & SONS,**
85, 87 and 89 Cliff St., New York.**L. COES'**Genuine Improved
KNIFE HANDLE
PATENT**Screw Wrenches**

MANUFACTURED BY

COES WRENCH CO.,

WORCESTER, MASS.

Established in
1880.Registered
March 31, 1874.Patented July
6, 1880.Patented July
8, 1884.

Sectional View illustrates our New Knife Handle, showing Malleable Iron Frame and Shank of Bar keyed into position

Straight Bar, Extra Long Nut for Screw in Jaw.

The BEST MADE and STRONGEST WRENCH in the MARKET**J. C. McCARTY & CO.,**
JOHN H. GRAHAM & CO. } New York Agents.

• IMPROVED MINE LAMP •
FOR ANTHRACITE AND
BITUMINOUS
MINING.

6
DIFFERENT
STYLES
OF SPOUTS.

SAMPLE 15¢.

SEAMLESS
BRASS
COLLAR
BRASS HINGE
Lid Solid
No SOLDERING

B. E. LEONARD, Scranton, Pa.

PATENT AIR TUBE MINE LAMP.

FIVE DIFFERENT
SIZED
SPOUTS

SEAMLESS
BRASS
COLLAR
BRASS HINGE
Solid Lid
NO SOLDERING
HINGE
CANNOT
MELT OFF.

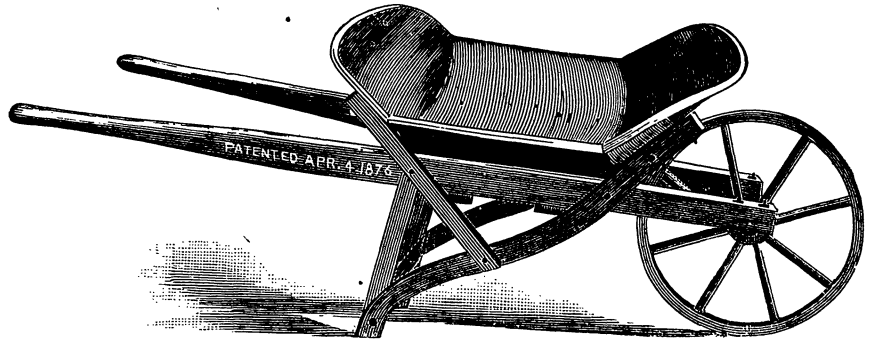
SEND
15 CENTS
FOR SAMPLE
TO SAMPLE

T. F. LEONARD - Scranton, Pa.

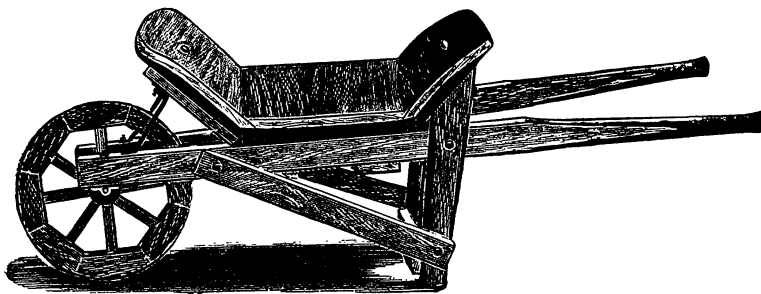
WHEELBARROWS.

CAPITAL.

One of the best sellers on the market.



CAPITAL PATENT BOLTED CANAL BARROW.



CLIMAX BOLTED BARROW.

CLIMAX.

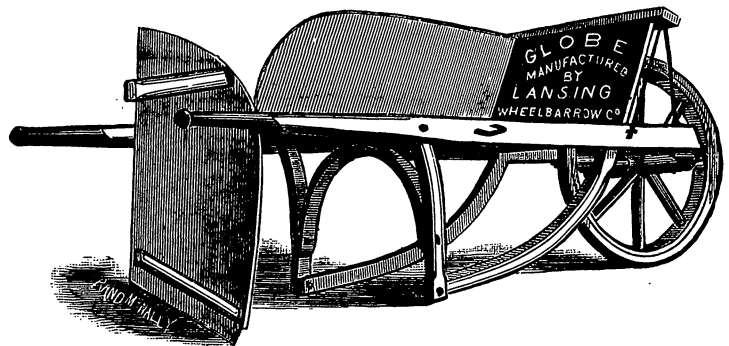
One of the best of the cheaper barrows.

EUREKA.

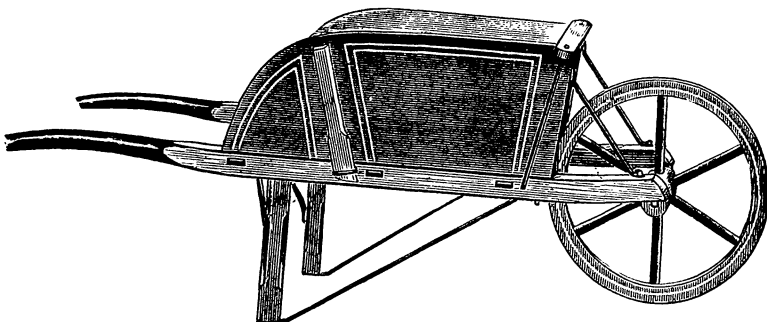
Similar to CLIMAX, but with iron hub wheel, trays cleated and bolted to handles.

GLOBE.

The old standby in the West. There have been many imitations, but no barrow sold in the West is so well made and nicely finished.



THE GLOBE PATENT GARDEN BARROW.



EASTERN GARDEN WHEELBARROW.

EASTERN.

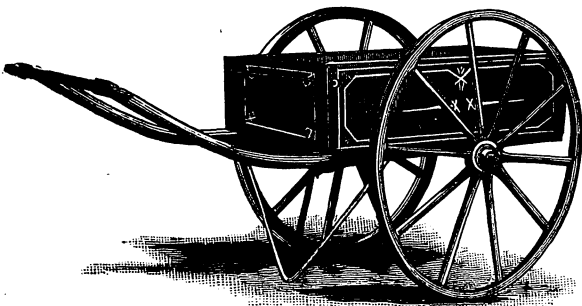
This is the strongest and best painted garden barrow on the market. Used largely in New England.

Write for prices of anything in the way of Barrows or Warehouse Trucks.

LANSING WHEELBARROW CO.,

LANSING, MICH.

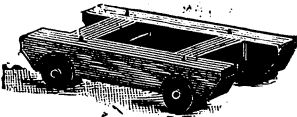
HAND CARTS AND TRUCKS.



HAND CART.

Carts of this kind are growing in popular favor daily. They should be kept in stock by every hardware dealer. Painters, Carpenters, Bill Posters, Masons, etc., find that they are ahead of anything else for carrying tools and light material. Farmers, too, use them to good advantage about the orchard or garden. Box easily adjustable. Handles on Carts No. 0 are not bent. Made with springs or third wheel if desired.

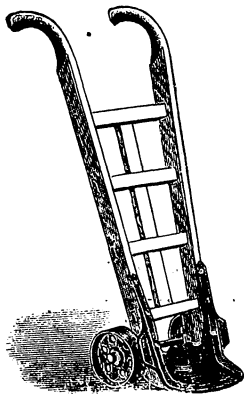
	Telegraph Name.	Diam. of Wheels.	Tread of Wheels.	Diam. of Axle.	Size of Box.	Depth of Box.	Weight each.	Packed for export—one doz. measures.	List Price each.
No. 0.....	Badger	42 in.	1 in.	1 in.	48 x 28 in.	10 in.	100 lbs.	95 cu. ft.	\$10.50
No. 1.....	Balcony	36 in.	1 in.	7/8 in.	40 x 23 in.	10 in.	90 lbs.	88 cu. ft.	9.00
No. 2.....	Ballast	30 in.	1 1/2 in.	1 1/8 in.	32 x 20 in.	9 in.	80 lbs.	70 cu. ft.	8.25



BOX TRUCK.

With 4 1/2 inch wheels, 1 1/2 inch face. Turned axles. Size 16 x 24 inches. Other sizes made to order. A handy truck for moving heavy boxes.

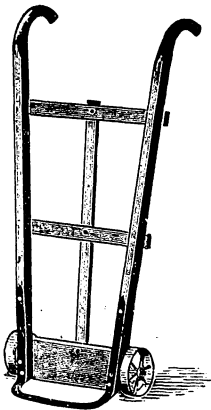
"No. 50" BAG TRUCK.



CAST NOSE, TURNED BEARINGS.

Length, 42 in ; width at nose, 11 1/4 in.; diameter of wheels, 6 in. ; weight, each, 20 lbs. Telegraph name, Adverb. For export, measure 6 cu. ft. per doz.

DANDY BAG TRUCK.



WROUGHT IRON NOSE, TURNED BEARINGS.

Length, 42 in.; width at nose, 11 in.; diameter of wheels, 6 in.; weight, each, 19 lbs. Telegraph name, Abandon. For export, measure 6 cu. ft. per doz.

Write for prices of Barrows, Carts or Warehouse Trucks to

LANSING WHEELBARROW CO.,
LANSING, MICH.

This is the Wrench Needed in Every Stable in America.



Sample to Dealers
by mail, post-
paid, 50c.

Better than any other because it can be operated quicker and easier than any other. Made of malleable iron and won't break with legitimate use. **No Nuts or Screws** to adjust; a simple pressure of the finger opens the jaws, which adjust themselves to any **Square Nut** from $\frac{3}{8}$ inch to $1\frac{1}{2}$ inch. Suitable for any ordinary carriage or wagon. The nut is grasped firmly by the jaws, and the handle forming a crank allows of the nut being turned off in the easiest, quickest and most natural manner with one hand. There is no occasion to touch the nut with the fingers, therefore no chance to soil the hands, and the annoyance of dropping the nut in the dirt is entirely overcome. When you get ready, it goes on just as easy as it came off.

**The Champion
of the World.**

Goodell & Company,

Sole Manufacturers,

ANTRIM, N. H.

The Cockburn Barrow and Machine Co.

OFFICE AND WORKS:

234 to 240 Eleventh St., - JERSEY CITY, N. J.
NEW CONCRETE MIXING MACHINES.

Coal and Ash Buckets, Coaling Tubs, Coal and Coke Cars, Patent Tubular Frame Wheelbarrows, Furnace Charging Barrows and Cars, Sheet Iron Work of every description, Patent Power Punching Machines. Every Description of General Forgings, Dimpfel blowers, Machine Work.

"Always Ready" Wrench.

FORGED STEEL, NICKEL PLATED.

PORTSMOUTH WRENCH CO.,

151 Congress St., Boston, Mass.

SEND FOR PRICES.



Machinists, Carriage Makers, Blacksmiths, Mechanics, Spinners, Weavers, Carders, and in all Departments of Woolen and Cotton Mills, Farmers, Housekeepers; and in fact everybody that ever uses a wrench

NEEDS THIS ONE.

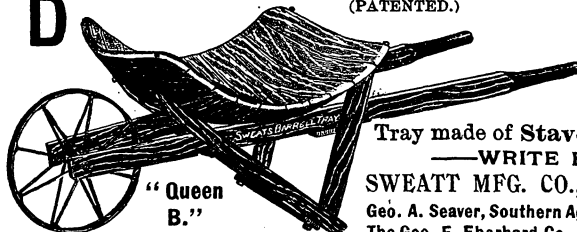
THE EAGLE WRENCH



Is revolutionizing the wrench trade by adjusting instantly on any size Pipe. Built of steel (drop forged) and Malleable Iron, with Wood Handles. No springs or small parts to give out.
HOLLANDS MFG. CO.,
ERIE, PA.

Manufacturers of All Styles Vises Small Tools &c.

"BARREL TRAY" WHEELBARROWS.



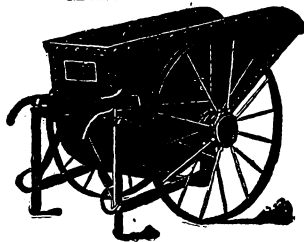
**BEST TRAY
FRAME
WHEEL.**

Tray made of Staves strung on Iron Rods.
—WRITE FOR PRICES.—

SWEATT MFG. CO., - Minneapolis, Minn.
Geo. A. Seaver, Southern Agt., 187 Chestnut St., N. Orleans.
The Geo. F. Eberhard Co., Coast Agts., San Francisco, Cal.

THE AKRON TOOL CO., Akron, O. Balanced Charging Barrows,

McNeil's Patent.

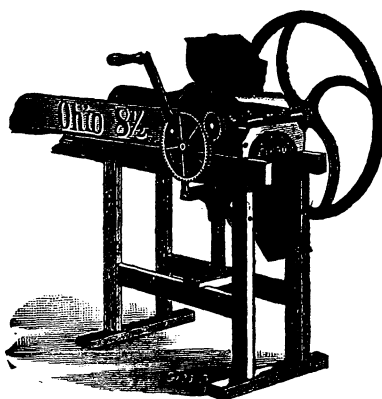


AUTOMATIC DUMP. IT HAS NO EQUAL.

ALSO

**AKRON TUBULAR STEEL WHEEL-
BARROWS**

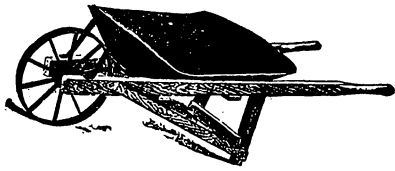
ONE MAN CAN HAUL A TON. RE-ENFORCED TRAY. CORNERS DOUBLE THICKNESS.



THE "OHIO" Feed and Ensilage
Cutters and Carriers are the best. By reason of wide open throat (being full width of cutting surface, all sizes), and improved feeding device, our machines have greater capacity than others.

THE SILVER MFG. CO., Salem, O.

HENION & HUBBELL, - CHICAGO,
LINDSAY BROS., - MILWAUKEE,
MANLEY & THOMPSON, ST. LOUIS, General Agents.



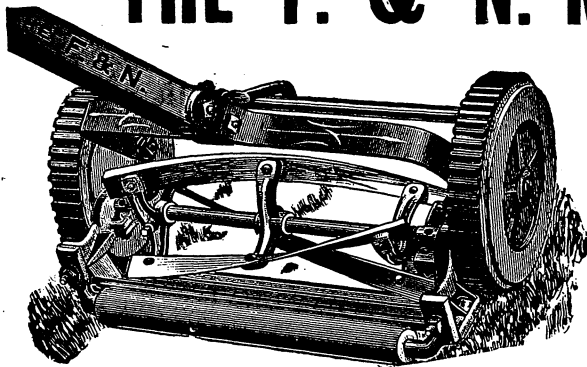
NONE STRONGER,
NONE BETTER,
NONE CHEAPER.

THE
Kilbourne & Jacobs Mfg. Co.
COLUMBUS, O., U. S. A.

WRITE FOR
CATALOGUE AND
PRICES.



THE F. & N. MFG. CO.,

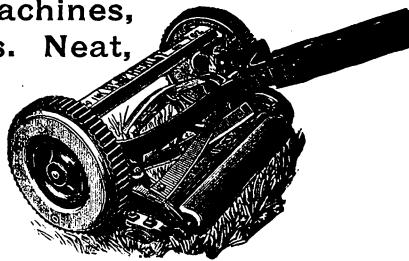


Manufacturers of
**Lawn Mowers, Lawn
Sweepers
and Grass Catchers,**
RICHMOND, IND., U.S.A.
The F. & N. High Grade Lawn
Mower. Fully Guaranteed.

AGENTS:
Woodrough & Hanchett Co.,
Chicago, Ill.
C. F. Guyon Co., Ltd., New York.
Woodrough, Mansfield & Co.
Boston Mass.

HENLEY'S LAWN MOWERS

First-class high grade machines,
made of the best materials. Neat,
symmetrical, strong, dura-
ble and unexcelled in con-
struction and ease of oper-
ation. Does perfect work.
For prices address



M. C. HENLEY, Sole Mfr., Richmond, Ind., U. S. A.

GARPENTER & BAYLES, Eastern Agents, 91 Chambers St. & 73 Reade St., New York City.

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Backus Patent Bit Braces,

RATCHET BRACES, ANGULAR BORERS,

Adjustable Socket Wrenches and Breast Drills.

Write for 1892 Catalogue and Price List.



Angular Borer.



Adjustable
Socket Wrench.

BACKUS MANUFACTURING CO.
WILLIAMSPORT, PA.

SELLS AT SIGHT.



Wanted by
Every Housekeeper.

Cottner's Pat. Dipper and Cup Handle.

Is the handiest thing out. With it a dipper can be made of a common glass, a tea cup, or a granite ware cup. The glass or cup can be securely attached to the handle or removed in a moment. The handle is very durable, and so cheap that they will sell at sight. For sale by all jobbers. Price \$7.20 per gross. If your jobber cannot supply you, send orders direct to

HOME NOVELTY MFG. CO., - - - St. Louis, Mo.

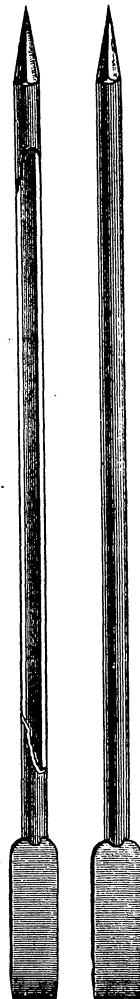
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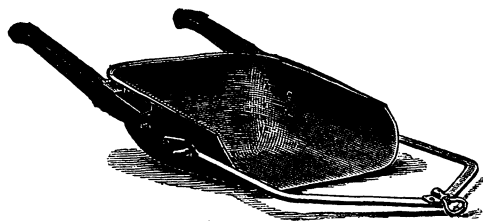


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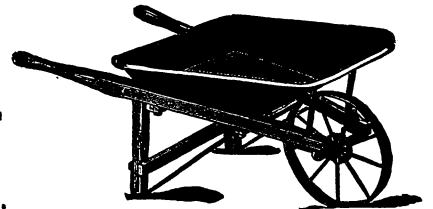
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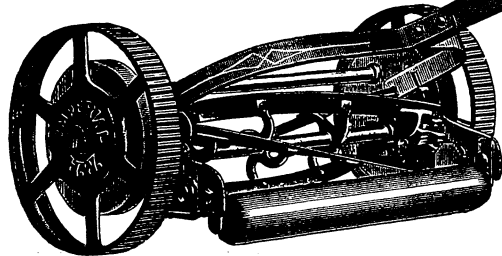


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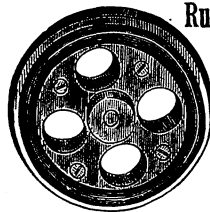
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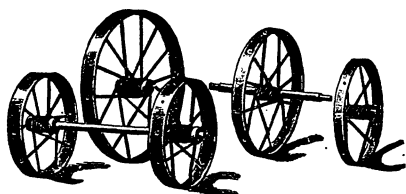


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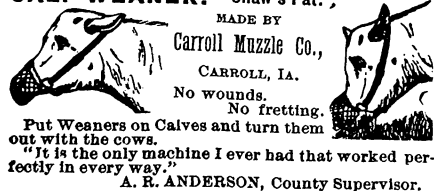
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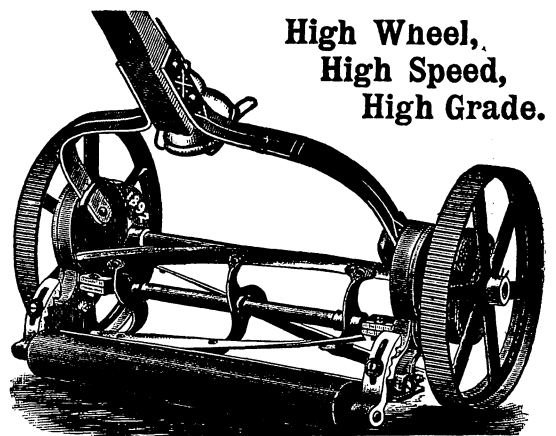
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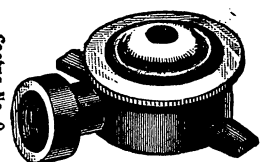


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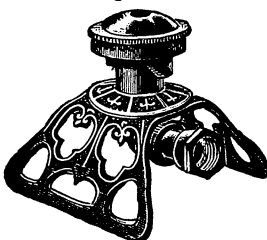
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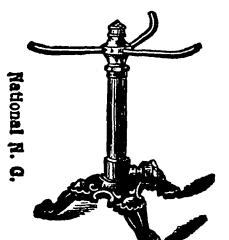


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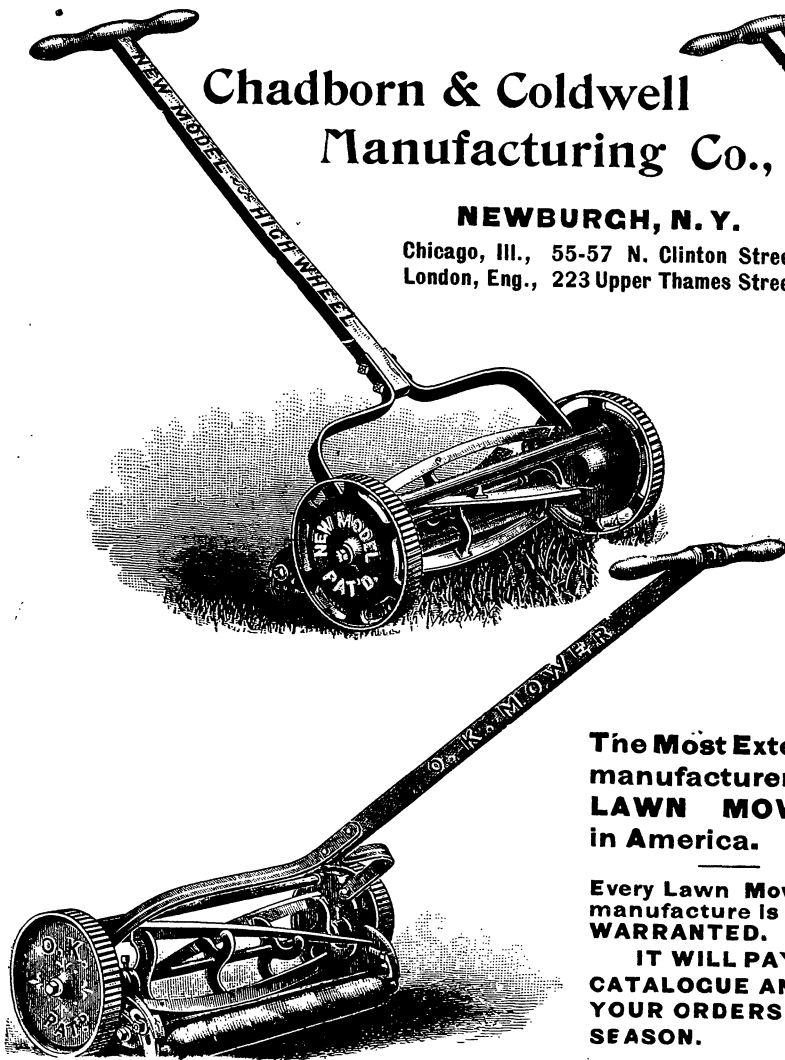
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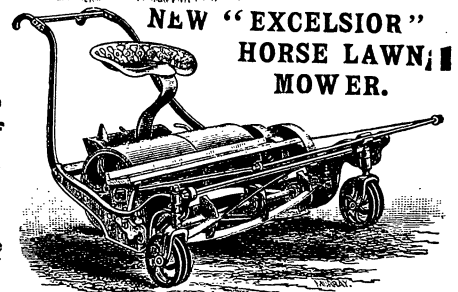
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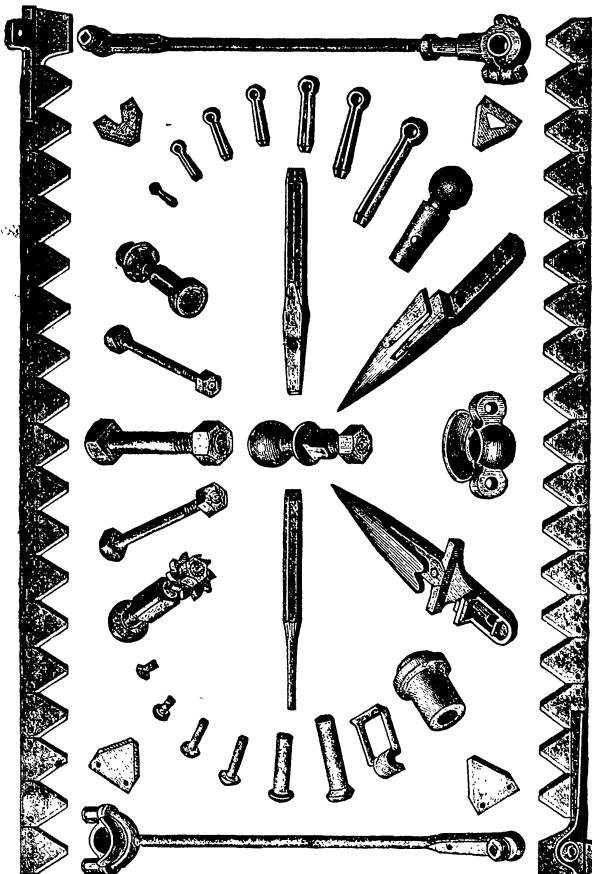
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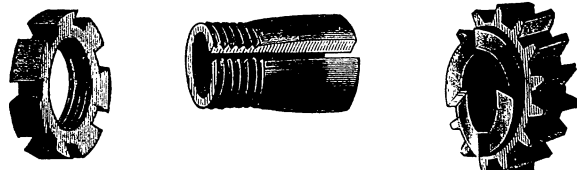
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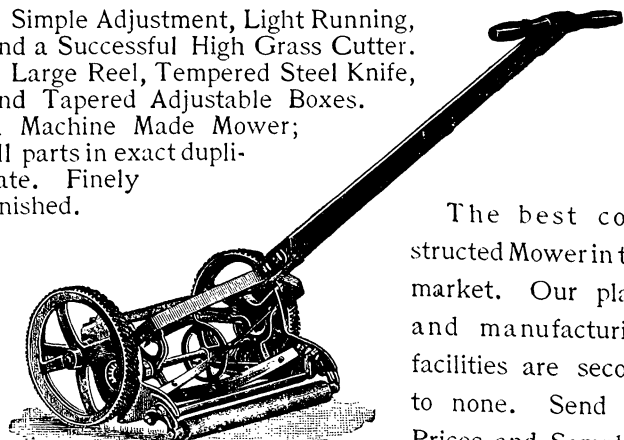


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A Machine Made Mower;
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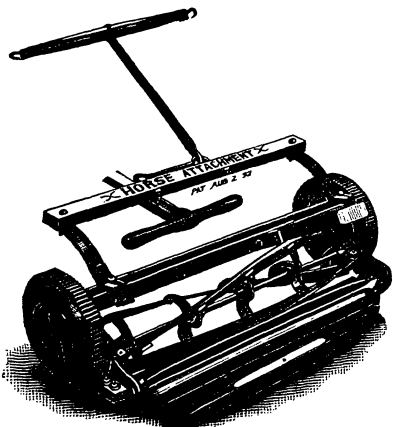
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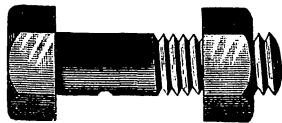
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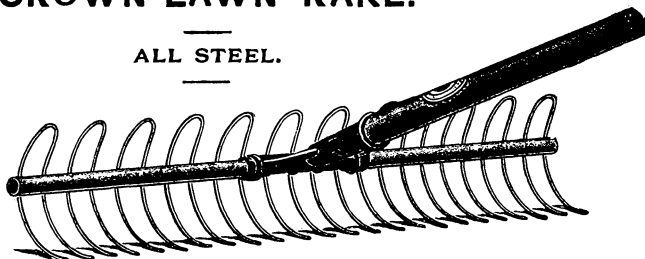
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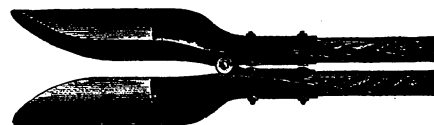
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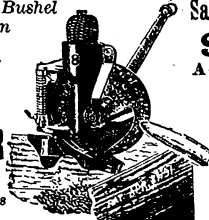
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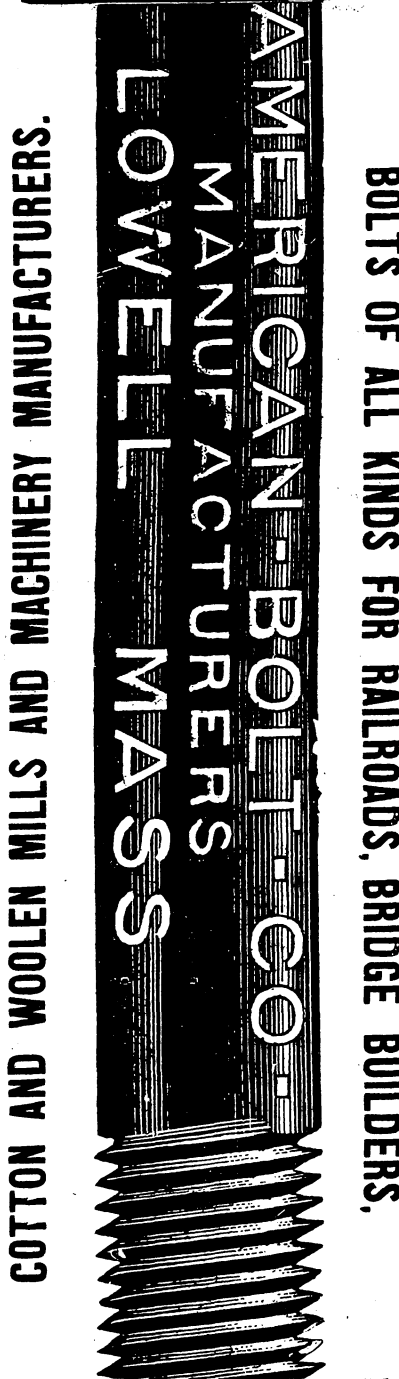
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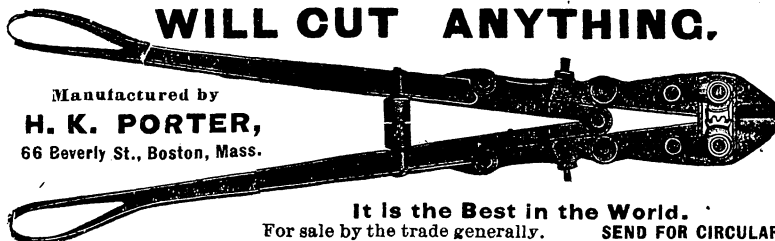
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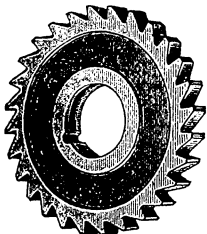
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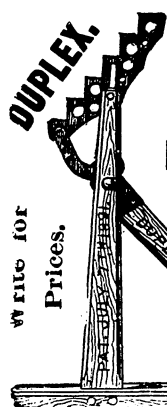
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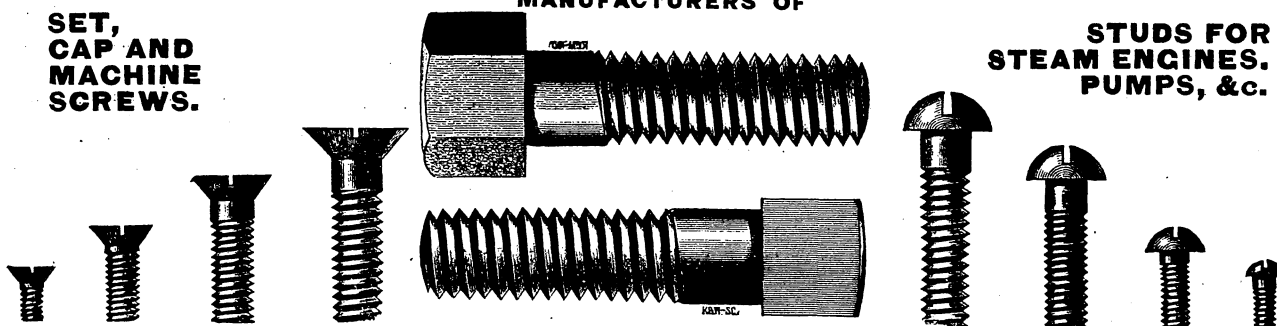
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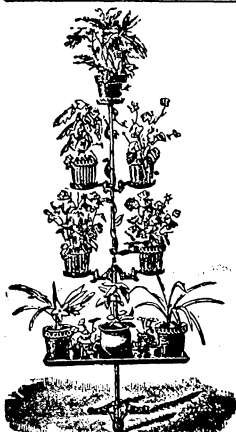
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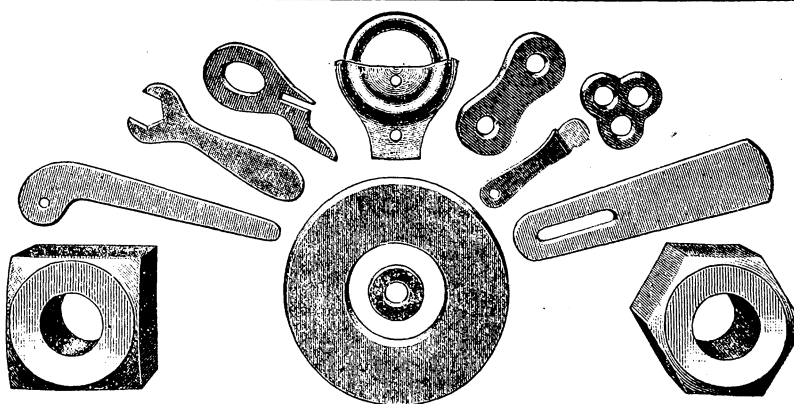
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Coventry Machine Co., Ltd., Boston, Mass.
Hulbert Bros. & Co., 28 W. 23d St., N. Y.
Lovell, Jno. P. Arms Co., Boston, Mass.
Pope Mfg. Co., Boston, Mass.
Read, Wm. & Sons, Boston, Mass.
Rouse, Hazard & Co., Peoria, Ill.
- Bird Cages.**
Pierce, Geo. N. & Co., Buffalo, N. Y.
- Bits and Reamers.**
Backus Mfg. Co., Williamsport, Pa.
Bridgeport Gun Implement Co., 313 315 Broadway, N. Y.
Fray, Jno. S. & Co., Bridgeport, Conn.
Jennings, C. E. & Co., 97 Chambers, N. Y.
Am. Bit Brace & Tool Co., Buffalo, N. Y.
- Blocks, Tackle, Makers of.**
Boston & Lockport Block Co., Boston, Mass.
and Lockport, N. Y.
Cleveland Block Co., Cleveland, O.
Fulton Iron & Engine Works, Detroit, Mich.
Toledo Block Works, Toledo, O.
- Blowers.**
Buffalo Forge Co., Buffalo, N. Y.
Champion Blower & Forge Co., Lancaster, Pa.
- Buyett & Smith Mfg. Co., Detroit, Mich.**
Sturtevant, B. F. & Co., Boston, Mass.
- Seller Makers' Bells.**
New Doty Mfg. Co., Janesville, Wis.
- Seller Plates.**
Carbon Steel Co., Pittsburgh, Pa.
McIlvain, Wm. & Sons, Reading, Pa.
Lukens Iron & Steel Co., Coatsville, O.
Pottstown Iron Co., Pottstown, Pa.
- Sellers, Copper.**
Randolph & Clowes, Waterbury, Conn.
- Sellers, Steam.**
Babcock & Wilcox Co., 30 Cortlandt.
Edge Moor Iron Co., Wilmington.
Kendall, Edw. & Son, Cambridgeport, Mass.
Pollock, W. B. & Co., Youngstown, O.
Southwick Fdy. & Mch. Co., Phila., Pa.
Wetherill, Robt. & Co., Chester, Pa.
- Selt Cutters.**
Chambers Bros. Co., Philadelphia.
Howard Iron Works, Buffalo, N. Y.
Porter, H. K., Boston, Mass.
Wells Bros. Co., Greenfield, Mass.
Wiley & Russell Mfg. Co., Greenfield, Mass.
- Beeks.**
Lamberson, B., Portland, Ore.
Williams, David, 36103 Reade, N. Y.
Wolcott & West, Syracuse, N. Y.
- Boring Machines.**
Buckeye Mfg. Co., Union City, Ind.
- Box Bander.**
Goodell & Harding, Burlington, Vt.
- Boxes, Hdw. Sheet, &c.**
Estes, E. B. & Sons, 252 Pearl St., N. Y.
Green, H., 32 Park Place, N. Y.
Jones, Jesse & Co., Philadelphia, Pa.
- Box Machinery.**
Nat. Metal Edge Box Co., Phila., Pa.
- Box Straps.**
Buffalo Specialty Mfg. Co., Buffalo, N. Y.
- Box Straps and Corners.**
Cary Mfg. Co., 41-43 Chambers St., N. Y.
- Brake Shoes.**
Congdon Brake Shoe Co., Chicago, Ill.
- Brass, Manufacturers of.**
Ansonia Brass & Copper Co., N. Y.
Day, John & Sons, 100 John, N. Y.
Edmister, Booth & Hayden, N. Y.
Plume & Atwood Mfg. Co., N. Y.
Randolph & Clowes, Waterbury, Conn.
Rome Brass and Copper Wks., Rome, N. Y.
Scovill Mfg. Co., Waterbury, Conn.
Waterbury Brass Co., 296 B'way, N. Y.
- Brass Bolt Headers.**
Tiebout, W. & J., 16 & 18 Chambers.
- Brass Foundries.**
Cramp, Wm. & Sons, S. & E. B. Co., Philadelphia, Pa.
Emory, P. F. Mfg. Co., Springfield, Mass.
Haight & Clark, Albany, N. Y.
Keys, W. W. & R. M. Co., Bridgeport, Conn.
Reeves, Paul S., Philadelphia, Pa.
Shaw, Luther & Son, Worcester, Mass.
- Brass Goods.**
Brass Goods Mfg. Co., 88 Chambers.
- Bridge Builders.**
Burlingame Iron Bridge Co., East Berlin, Ct.
Boston Bridge Works, Boston, Mass.
- Bronze (Tobin).**
Ansonia Brass & Copper Co., 19-26 Cliff Street, N. Y.
- Brooms and Brushes.**
Lay, Jos. & Co., Ridgely, Ind.
- Buildings, Etc., Makers of.**
Deitz, E., 97 Chambers St., N. Y.
Reading Hdw. Co., Reading, Pa.
Russell & Erwin Mfg. Co., N. Y. City.
Sargent & Co., 37 Chambers St., N. Y.
Warner Lock Co., Chicago, Ill.
Yale & Towne Mfg. Co., Stamford, Ct.
Brittan Graham & Mathes Pittsburg Pa.
- Butcher and Sausage Knives, Manufacturers of.**
Goodell Co., Antrim, N. H.
Wilson, John, Sheffield, England.
- Butts and Hinges.**
McKinney Mfg. Co., Allegheny, Pa.
Sabin Machine Co., Montpelier, Vt.
Stanley Works, New Britain, Conn.
Tiebout, W. & J., 16 Chambers, N. Y.
Brittan Graham & Mathes Pittsburg Pa.
- Cabinet Makers' Bench.**
Grand Rapids Hand Screw Co., Grand Rapids, Mich.
- Calif Weaners.**
Carroll Muzzie Co., Carroll, Ia.
- Campers and Hiviers.**
J. Stevens Arms and Tool Co., Chicopee Falls, Mass.
Starrett, L. S., Athol, Mass.
- Cann Openers.**
Kohler, F. E. & Co., Canton, O.
Meisselbach, A. F. & Bro., Newark, N. J.
- Car Axles.**
Roberts, A. & P. & Co., Phila.
- Carboy Stands.**
Hillebrand & Wolf, Philadelphia, Pa.
- Car Wheels.**
Whitney, A. & Sons, Phila.
- Carriage Hardware, Makers of.**
Cover's Saddlery Works, Farmer, N. Y.
Eccles, Richard, Auburn, N. Y.
McKinnon Dash & Hdw. Co., Ltd., Buffalo, N. Y.
Scranton Forging Co., Scranton, Pa.
Smith, H. D. & Co., Plantville, Conn.
Wilcox & Howe Co., Birmingham, Conn.
- Carriage Reloading Tools.**
Ideal Mfg. Co., New Haven, Conn.
- Casters, Wheel, &c.**
Clark, G. P., Windsor Locks, Conn.
Gwinner Mfg. Co., Hamilton, O.
- Castings, Iron and Steel.**
Ames Sword Co., Chicopee, Mass.
Arcade Malleable Iron Co., Worcester, Mass.
Aschman Steel Casting Co., Thurlow, Pa.
Booth, The Lloyd, Co., Youngstown, O.
The Burr & Houston Co., Brooklyn, N. Y.
Cambria Steel-Cambria Iron Co., Johnstown, Pa.
Cheney, S. & Son, Manlius, N. Y.
Chester Steel Casting Co., Phila.
Congdon Brake Shoe Co., Chicago, Ill.
- Ette & Hanger Mfg. Co., St. Louis, Mo.**
Eureka Cast Steel Co., Chester, Pa.
Flagg, Stanley G. & Co., Phila.
Haight & Clark, Albany, N. Y.
Hammer & Co., Branford, Conn.
Herrick, J. A., 284 Pearl St., N. Y.
Jackson & Woodin Mfg. Co., Berwick, Pa.
Johnson Foundry Co., Johnstown, Pa.
Johnson, I. G. & Co., Spuyten Duyvil.
Lima Steel Casting Co., Lima, O.
Mahoning Fdry & Mch. Co., Danville, Pa.
New Castle Steel Casting Co., New Castle, Pa.
Norristown Steel Co., Norristown, Pa.
Northwest Malleable Iron Co., Milwaukee, Wis.
Novelty Iron Works, Allentown, Pa.
Palmer & De Mooy, Cleveland, O.
Passaic Art Casting Co., Passaic, N. J.
Penna. Diamond Drill & Mfg. Co., Birdsboro, Pa.
Pratt & Letchworth, Buffalo, N. Y.
Sessions Foundry Co., Bristol, Conn.
Shepard Hdw. Co., Buffalo, N. Y.
Shilling Fdy. Co., Columbus, O.
Spencer, I. S., Sons, Guilford, Conn.
Springfield Fdy. Co., Springfield.
Standard Fdy. & Mfg. Co., Cleveland, O.
Standard Steel Casting Co., Thurlow, Pa.
Syracuse Steel Foundry, Syracuse, N. Y.
Taylor & Boggs Fdry Co., Cleveland, O.
Totten & Hogg Iron & Steel Fdry Co., Pittsburgh, Pa.
Trenton Mch. Iron Co., Trenton, N. J.
Union Mfg. Co., 103 Chambers St., N. Y.
Wetherill, Robt. & Co., Chester, Pa.
Taylor Iron & Steel Co., High Bridge, N. J.
- Chains.**
Bradlee & Co., Philadelphia.
Bridgeport Chain Co., Bridgeport, Conn.
Wm. H. Haskell Co., Pawtucket, R. I.
Link-Belt Engineering Co., Phila.
McKay, Jas. & Co., Pittsburgh, Pa.
- Chimneys.**
Phila. Engineering Works, Phila., Pa.
- Chisels, Manufacturers of.**
Buck Bros., Millbury, Mass.
White, L. & J. J., Buffalo, N. Y.
- Chucks.**
Graham Twist Drill & Chuck Co., Detroit, Mich.
Hogson & Pettis Mfg. Co., New Haven, Conn.
Horton, E. & Sons Co., Windsor Locks, Conn.
Smith & Edge Mfg. Co., Bridgeport.
Stark Chuk Co., New Britain, Conn.
Union Mfg. Co., 103 Chambers, N. Y.
Whitlock, Wm., 132d St. & Park Ave., Whitton, D. & Mach. Co., New London, Conn.
- Clamps.**
Hammer & Co., Branford, Conn.
Horton, C. W., So. Norwalk, Conn.
- Clippers.**
Lee, Jesse & Sons, 37 So. Fourth St., Philadelphia, Pa.
- Clipping Machines.**
Hotchkiss, E. S., Bridgeport, Conn.
McCoy, Jos. F. & Co., 24 Warren St.
Crosby Springs, Manufacturers of.
Haley Mfg. Co., Concord, N. H.
- Cool.**
Barns, C. K. & Co., Philadelphia, Pa.
Wister, Francis, Philadelphia, Pa.
- Coffee and Spice Mills.**
Acme Mfg. Co., E. Freeport, Ill.
Waddell, J. M. Mfg. Co., Greenfield, O.
- Corn.**
Barns, C. K. & Co., Philadelphia, Pa.
Krick, A. O. & Co., Pittsburg, Pa.
Houston, O. B. & Co., Philadelphia, Pa.
Rainey, W. J., Cleveland, O.
Sibell, Geo. H. & Co., Chicago, Ill.
Wister, Francis, Philadelphia, Pa.
- Corkers.**
Samson Cordage Works, Boston, Mass.
Travers Bros. Co., 107 Duane St., N. Y.
- Cork screws.**
Williamson, C. T. Wire Novelty Co., Newark, N. J.
- Corn Poppers.**
Olson, A. P., Kansas City, Mo.
- Corn Shellers.**
Carr Iron Fdy. Co., Cleveland, O.
- Corrugated Furnaces.**
Continental Iron Wks., Brooklyn, N. Y.
- Corrugated Iron.**
Cambridge Roofing Co., Cambridge, O.
Cincinnati Corrugating Co., Fluga, O.
Miller, Jas. A. & Bro., Chicago, Ill.
Mosley Iron Bridge & Roof Co., 5 Day, N. Y.
- Countersinks.**
Smethport Machine Co., Ltd., Smethport, Pa.
- Counting Machines.**
Osborn, G. Edw. & Co., New Haven, Ct.
- Coupling.**
Almond, T. R., Brooklyn, N. Y.
- Coverings, Boiler and Pipe.**
Johns, H. W. Mfg. Co., 37 Maiden Lane.
- Cranes.**
Allentown Rolling Mills, Allentown, Pa.
Collins, Victor, Detroit, Mich.
Detroit Foundry Equipment Co., Detroit, Mich.
Maris & Beekley, Philadelphia, Pa.
Ridgway, Craig & Sons, Coatesville, Pa.
- Sellers, Wm. & Co., Inc., Phila., Pa.**
Yale & Towne Mfg. Co., Stamford, Conn.
- Cupolas, Hot-Blast.**
Byram & Co., Detroit, Mich.
- Curry Combs.**
Kohler, F. E. & Co., Canton, O.
Noyes, B. B. & Co., Greenfield, Mass.
- Cutlery, Importers of.**
Gurney, Fred B., 116 Chambers St., N. Y.
Sickles, Sweet & Lyon, 35 Barclay, N. Y.
- Cutlery, Manufacturers of.**
Amer. Cutlery Co., Chicago, Ill.
Chapin Cutlery Co., Toledo, Ohio.
Curley, J. & Bro., 6 Warren St., N. Y.
Dane, Stoddard & Kendall, Boston, Mass.
Electric Outlery Co., 119 Chambers, N. Y.
Goodell Co., Antrim, N. H.
Landers, Frary & Clark, New Britain, Conn.
Meriden Cutlery Co., Meriden, Conn.
Northampton Cutlery Co., Northampton, Mass.
Wilson, John, Sheffield, England.
- Dipper Handles.**
Home Novelty Mfg. Co., St. Louis, Mo.
- Dog Collars.**
Chapman Mfg. Co., Meriden, Conn.
Union Hardware Co., Torrington, Ct.
- Door Checks.**
Utility Door Check Co., Chicago, Ill.
- Door Knobs.**
Halsey & Ware, 49 & 151 Baxter St., N. Y.
- Drain Cleaners.**
Buckeye Mfg. Co., Union City, Ind.
- Drilling Machines.**
Boynton & Plummer, Worcester, Mass.
Brady Mfg. Co., Brooklyn, N. Y.
Buffalo Forge Co., Buffalo, N. Y.
Burnham, Geo. & Co., Worcester, Mass.
Champion Blower and Forge Co., Lancaster, Pa.
Colburn, A. L., New Haven, Conn.
Dallett, Thos. H. & Co., Philadelphia.
Dwight Slate Machine Co., Hartford, Conn.
Halsey, Jas. T., Philadelphia, Pa.
Illinois Iron and Bolt Co., Carpentersville, Ill.
Millers Falls Co., 98 Reade, N. Y.
Norton & Jones Machine Tool Works, Plainville, Conn.
Quint, A. D., Hartford, Conn.
Sellers, Wm. & Co., Inc., Phila., Pa.
Sibley & Ware, So. Bend, Ind.
Sigourney Tool Co., Hartford, Conn.
Silver Mfg. Co., Salem, O.
Smith Friction Drill & Tool Co., Boston, Mass.
Woodward & Rogers, Hartford, Conn.
- Dress Fastenings.**
Barnes Machine Co., New Haven, Conn.
Billings & Spencer Co., Hartford, Conn.
Boone, W. C. Mfg. Co., Boonton, N. J.
Eccles, Richard, Auburn, N. Y.
Herbrand Co., Fremont, O.
Merrill Bros., 26 First, Brooklyn, E. D.
Miner & Peck Mfg. Co., New Haven, Ct.
Phila. Drop Forge Co., Philadelphia, Pa.
Rhode Island Tool Co., Providence, R. I.
Scranton Forging Co., Scranton, Pa.
Spies, J. C. & Co., Worcester, Mass.
Williams, J. H. & Co., Brooklyn, N. Y.
Wilmot & Hobbs Mfg. Co., Bridgeport, Conn.
- Drop Presses.**
Bliss, E. W. & Co., Brooklyn, N. Y.
Crosby, G. A. & Co., Chicago, Ill.
Easton, Geo. H. & Co., Boston, Mass.
Ferracute Mch. Co., Bridgeport, N. J.
Miner & Peck Mfg. Co., New Haven, Conn.
Stiles & Parker Press Co., Brooklyn, N. Y.
- Waterbury Farrel Foundry and Machine Co., Waterbury, Conn.**
- Dumb Waiters.**
Storm Mfg. Co., Newark, N. J.
- Dynamite.**
New York Powder Co., 62 Liberty St., N. Y.
- Dynamones.**
Lovell Mfg. Co., Ltd., Erie, Pa.
Zucker & Levett Chemical Co., 10 to 14 Grand St., N. Y.
- Edge Tools, Makers of.**
Amer. Axe & Tool Co., 280 B'way, N. Y.
Buck Irons, Millbury, Mass.
Butcher, Wm. & S., 136 Duane St., N. Y.
Erie Tool Works, Buffalo, N. Y.
Mann Edge Tool Co., Lewiston, Pa.
Plumb, Fayette R., Philadelphia, Pa.
Standard Axe & Tool Co., Ridgway, Pa.
White, L. & J. J., Buffalo, N. Y.
- Egg Beaters.**
North Bros. Mfg. Co., Philadelphia.
- Electric Belts and Supplies.**
Ostrander, W. R. & Co., New York.
Wollensak, J. F., Chicago, Ill.
- Electric Dynamo Machines.**
Eddy Electric Mfg. Co., Windsor, Conn.
Hanson & Van Winkle Co., Newark, N. J.
- Electric Elevators.**
Smith Hill Co., Quincy, Ill.
- Electric Welding.**
Thomson Electric Welding Co., Boston, Mass.
- Electro-Platers.**
Boardman, L. & Son, East Haddam, Ct.
- Elevator Buckets.**
W. J. Clark & Co., Salem, Ohio.
- Elevator Gates.**
Richmond Safety Gate Co., Richmond, Ind.
- Elevators, Makers of.**
Link-Belt Engineering Co., Phila., Pa.
Moline Elevator Co., Moline, Ill.
Morse, Williams & Co., Phila., Pa.
Salem Fdry & Mch. Co., Salem, Mass.
Variety Mch. Co., Warsaw, N. Y.
- Emery Wheels.**
Excelstor Emery Wheel Co., Springfield, Mass.
Grant Corundum Wheel Mfg. Co., Chester, Mass.
Michigan Emery Wheel Co., Detroit, Mich.
N. Y. Belting & Packing Co., Ltd., N. Y.
Northampton Emery Wheel Co., Leeds, Mass.

- Norton Emery Wheel Co., Worcester, Mass.
Springfield Emery Wheel Mfg. Co. Bridgeport, Conn.
Waltham Emery Wheel Co., Waltham, Mass.
- Enamels.**
Nubian Iron Enamel Co., Cragin Ill.
Engineers, Builders, Contractors.
Allen Henry, Pittsburgh, Pa.
Brady Mfg. Co., Brooklyn, N. Y.
Carten, Henry J., Pittsburgh, Pa.
Christie, W. Wallace, Paterson, N. J.
Curtis, Gram, Pittsburgh, Pa.
Herrick, J. A., 284 Pearl St., N. Y.
Kennedy, Julian, Pittsburgh, Pa.
Laughlin, Alex. H., Pittsburgh, Pa.
Lean, D. R. Co., Pittsburgh, Pa.
McClure & Analer, Pittsburgh, Pa.
Pittsburgh Iron & Steel Engineering Co., Pittsburgh, Pa.
Roberts, Frank C., Philadelphia, Pa.
Smith, S. V., Pittsburgh, Pa.
Smythe, S. R. Co., Incorporated Pittsburgh, Pa.
Swindle W. & Bros., Pittsburgh, Pa.
Winkie, Bothwell & Co., Ltd., Pittsburgh, Pa.
Zellweger, J., St. Louis, Mo.
- Engines, Gas.**
Otto Gas Engine Works, Phila., Pa.
Engines, Steam, Makers of.
American Engine Co., Bound Brook, N. J.
Buckeye Engine Co., Salem, Ohio.
Cleveland & Harwick, Erie, Pa.
Harrisburg Fdy. & Machine Works, Harrisburg, Pa.
Lane & Bodley Co., Cincinnati, O.
Norwalk Iron Works Co., So. Norwalk, Conn.
Shipman Engine Co., Boston, Mass.
Southward Foundry and Machine Co., Phila., Pa.
Tod, William & Co., Youngstown, O.
Wetherill, Robt. & Co., Chester, Pa.
- Exhaust Tumblers.**
Sweester, W. A., Brockton, Mass.
- Expansion Belts.**
Boone, W. O. & Son, Brooklyn, N. Y.
Church, Isaac, Toledo, O.
- Faucets, Self-Pressing.**
Lane Bros., Poughkeepsie, N. Y.
- Faucets, Wooden, Makers of.**
Boston & Lockport Block Co., Boston, Mass., and Lockport, N. Y.
John Sommer's Son, Newark, N. J.
- Feed-Water Heaters.**
Berryman, Jas., Philadelphia, Pa.
Davis, I. B. & Son, Hartford, Conn.
Goubert Mfg. Co., 82 Cortlandt St., N. Y.
National Pipe Bending Co., New Haven, Conn.
Webster, Warren & Co., Phila., Pa.
Whitlock Coil Pipe Co., Elmwood, Conn.
- Fencing, Iron and Wire.**
B. B. Wire Co., Indianapolis, Ind.
Barnum, E. T., Detroit, Mich.
Champion Iron Co., Kenton, O.
Clinton Wire Cloth Co., Clinton, Mass.
DeKalb Fence Co., DeKalb, Ill.
Gilbert & Bennett Mfg. Co., 43 Cliff St., Hartman Mfg. Co., 43 Cliff St., Phila.
Kilmer, F. G., Newburgh, N. Y.
Mast, Fogs & Co., Cincinnati, O.
The Van Dorn Iron Works Co., Cleveland, O.
Wright & Colton Wire Cloth Co., Worcester, Mass.
Reliance Wire Works Co., Milwaukee, Wis.
- Files, Iron, of.**
Moss, F. W., 80 John, N. Y.
- Files and Rasps, Manufacturers of.**
Barnett, G. & H., 41 & 43 Richmond Phila.
Butcher, W. & S., 135 Duane St., N. Y.
McCauley File Co., Philadelphia.
Nicholson File Co., Providence R. I.
- Fire Bricks, Makers of.**
Borger, Cyrus, Philadelphia, Pa.
Gardner, Jas. & Son, Cumberland, Md.
Kreischer B. & Sons, foot E. Houston, St. Maurer, H. & Son, 420 E. 28d, N. Y.
Renovo Fire Brick and a Clay Co., Phila.
Strander Fire Brick Co., Troy, N. Y.
Presbrey Stove Lining Co., Taunton, Mass.
- Union Mining Co., Philadelphia, Pa.**
Valentine, M. D. & Bro., Woodbridge, N. Y.
- Fire Sets.**
Troy Nickel Works, Troy, N. Y.
- Fishing Tackle.**
Dane, Stoddard & Kendall, Boston, Mass.
- Enterprise Mfg. Co., Akron, O.**
- Flint and Emery Paper.**
Baeder, Adamson & Co., Phila., Pa.
- Flour Sifters.**
Meyers, F. J. Mfg. Co., Covington, Ky.
- Flower Stands.**
Covington, S. E., Bellefontaine, O.
- Fodder Cutters.**
Silver Mfg. Co., Salem, O.
- Forges, Portable, &c.**
Bradley & Co., Syracuse, N. Y.
Bullock Bellows Co., Cleveland, O.
Buffalo Forge Co., Buffalo, N. Y.
Champion Blower & Forge Co., Lancaster, Pa.
Empire Portable Forge Co., Lansingburg, N. Y.
Foss Mfg. Co., Springfield, Ohio.
Sturtevant, B. F. Co., Boston, Mass.
- Forgings, Iron and Steel.**
Bethlehem Iron Co., S. Bethlehem, Pa.
Cambria Steel-Cambria Iron Co., Johnstown, Pa.
Scranton Forging Co., Scranton, Pa.
- Foundry Facings.**
Chicago Fdy. Supply Co., Chicago, Ill.
MacKellar Foundry Facing & Supply Co., Quincy, Ill.
Paxson, J. W. & Co., Phila.
S. Obermayer Co., Cincinnati, O.
Smith, J. D. Fdy. Supply Co., Cinn., O.
Whitehead Bros. Co., 517 W. 15th St.,
- Foundry Riddles.**
Estey, W. S., 85 Fulton, N. Y.
- Foundry Supplies.**
Chicago Fdy. Supply Co., Chicago, Ill.
Colliau, Victor, Detroit, Mich.
MacKellar Fdy. Facing & Supply Co., Quincy, Ill.
S. Obermayer Co., Cincinnati, O.
Paxson, J. W. & Co., Philadelphia.
Smith, J. D. Fdy. Supply Co., Cinn., O.
Whitehead Bros. Co., 517 W. 15th St.,
- Friction Clutches.**
Moore & White Co., Philadelphia, Pa.
- Fruit Presses.**
Enterprise Mfg. Co., Philadelphia, Pa.
- Fuel Burners.**
Collins, W. S., 45 Drexel Bldg., N. Y.
- Furnaces, Foundry.**
Byram & Co., Detroit, Mich.
- Garden Tools.**
Dunlap, C. W., Box 2708, New York.
Koyne, B. B. & Co., Greenfield, Mass.
- Gas Producers.**
Wood, R. D. & Co., Philadelphia, Pa.
- Gas & Steam Fitters' Supplies.**
Pancoast & Maule, Phila., Pa.
- Gear Cutters.**
T. E. Whiton Mach. Co., New London, Conn.
- Gears.**
Boston Gear Works, Boston, Mass.
New Process Raw Hide Co., Syracuse, N. Y.
People, Robt. & Son Co., Baltimore, Md.
- Glass Boards.**
Canton Saw Co., Canton, O.
- Glass Tubes.**
Ashcroft Mfg. Co., 111 Liberty St., N. Y.
- Glass Cutters.**
Monroe, S. G., Bristol, Conn.
- Glue.**
Baeder, Adamson & Co., Phila., Pa.
Improved Process Glue Co., Gloucester, Mass.
- Russia Cement Co., Gloucester, Mass.**
- Grass Catchers.**
Norton Emery Wheel Co., Worcester, Mass.
- Grinding Mills.**
Foss Mfg. Co., Springfield, O.
- Grinding and Polishing Machines.**
Diamond Mch. Co., Providence, R. I.
Herrick & Cowell, New Haven, Conn.
Norton Emery Wheel Co., Worcester, Mass.
Washburn Shops, Worcester, Mass.
- Grindstone Dressing Machinery.**
Blake & Johnson, Waterbury, Conn.
- Grindstones.**
Cleveland Stone Co., Cleveland, O.
Huron Grindstone Co., Port Austin, Mich.
- Gun Implements.**
Union Hdw. Co., Torrington, Conn.
- Gunpowder, Makers of.**
Lafin & Rand Powder Co., N. Y.
- Hand Carts.**
Lansing Wheelbarrow Co., Lansing, Mich.
- Hand Screws.**
Grand Rapids Hand Screw Co., Grand Rapids, Mich.
- Handies.**
Estes, E. B. & Sons, 254 Pearl St., N. Y.
New Process Raw Hide Co., Syracuse, N. Y.
New York Mallet and Handle Wks., 456 E. Houston St., N. Y.
- Hangers, Door.**
Chicago Spring Butt Co., Chicago, Ill.
Coleman Hdw. Co., Chicago, Ill.
Cronk Hanger Co., Elmira, N. Y.
Lancroft, Poughkeepsie, N. Y.
Victor Mfg. Co., Newburyport, Mass.
- Hardware Common Merchants.**
Docher, Martin, 88 Chambers, N. Y.
Jacobus, W. H., 90 Chambers, N. Y.
- Hardware Manufacturers.**
Dunlap, C. W., Box 2708, New York.
Eckstis, E. C., Bridgeport, Conn.
Stearns, E. C. & Co., Syracuse, N. Y.
Union Mfg. Co., 108 Chambers, N. Y.
Yale & Towne Mfg. Co., Stamford, Conn.
- Hardware Mfrs. Agents.**
Bingham, W. Co., Cleveland, O.
Graham, John H. & Co., 111 Chambers St., New York.
McKay, Jos. E. Co., 20 Warren St., N. Y.
Sickles, Sweet & Lox, 55 Barclay, N. Y.
Surplus, Dunn & Alder, 97 Chambers St., New York.
Underhill, Clinch & Co., 94 Chambers St., N. Y.
- Hardware Specialties.**
Acme Shear Co., Bridgeport, Conn.
Bailey, F. E. & Co., Chicago, Ill.
Belden Machine Co., New Haven, Conn.
Clark Mfg. Co., Buffalo, N. Y.
Copeland Hdw. Mfg. Co., Worcester, Mass.
Ellrich Hdw. Mfg. Co., Plantsville, Conn.
Empire Portable Forge Co., Lansingburg, N. Y.
Enterprise Mfg. Co., Philadelphia, Pa.
Ette & Henger Mfg. Co., St. Louis, Mo.
Gwinner Mfg. Co., Hamilton, O.
Hart, H. O. Mfg. Co., Detroit, Mich.
Henn, A. S. & Co., New Haven, Conn.
Home Novelty Mfg. Co., St. Louis.
North Bros. Mfg. Co., Philadelphia, Pa.
Welland, Chas., 143 Chambers St., N. Y.
Wire Goods Co., Worcester, Mass.
Underhill, Clinch & Co., 94 Chambers Street, N. Y.
- Hardware, Yacht and Ship.**
Ferdinand, L. W. & Co., Boston, Mass.
- Harness Snaps.**
Covert Mfg. Co., West Troy, N. Y.
Covert's Saddlery Wks. Farmer, N. Y.
Fitch, W. & E. T., New Haven, Conn.
- Hay Knives.**
Holt, Hiram, Co., E. Wilton, Me.
- Holisting Machines.**
Jox, Alfred & Co., 314 Green, Phila.
Jrow, Holisting & Conveying Mch. Co., Cleveland, Ohio.
- Fulton Iron & Engine Wks., Detroit, Mich.**
Harrington, E., Son & Co., Phila.
Lane Bros., Poughkeepsie, N. Y.
Lidgerwood Mfg. Co., 96 Liberty, N. Y.
Maria & Beekley, Philadelphia.
Moore Mfg. & Fdy. Co., Milwaukee, Wis.
- Morse, Williams & Co., Phila.**
Sellers, Wm. & Co., Phila. and N. Y.
Speldel, J. G., Reading, Pa.
Yale & Towne Mfg. Co., Stamford, Ct.
- Hollow-Ware.**
Bronson Supply Co., Cleveland, Ohio.
Cleveland Stamping & Tool Co., Cleveland, O.
Stuart & Peterson Co., Phila., Pa.
- Hollowware, Aluminum.**
Illinois Pure Aluminum Co., Lemont, Ill.
- Horse and Barbers' Clippers.**
Hotchkiss, E. S., Bridgeport, Conn.
- Horse Nails, Makers of.**
Ausable Horse Nail Co., Warren, N. Y.
National Horse Nail Co., Vergennes, Vt.
- Horse Shoes, Makers of.**
Bryden Horse Shoe Co., Catsaqua, N. Y.
Diamond State Iron Co., Wilmington, Del.
Old Dominion Iron & Nail Works Co., Richmond, Va.
Phoenix Horse Shoe Co., Poughkeepsie, N. Y.
Rhode Island Perkins Horse Shoe Co., Providence.
Standard Horse Shoe Co., Boston, Mass.
The Burden Iron Co., Troy, N. Y.
- Hose.**
Cleveland Rubber Co., Cleveland, O.
N. Y. Belting & Packing Co., Ltd., 15 Park Row, N. Y.
- Hydrants, &c.**
McLean, John, 296 & 298 Monroe, N. Y.
- Hydraulic Jacks.**
Dudgeon, Richard, 24 Columbia, N. Y.
Watson & Stillman, 204 E. 48d, N. Y.
- Ice Cream Freezers.**
Norton Mfg. Co., Phila., Pa.
Packer, C. W., Philadelphia, Pa.
Peerless Freezer Co., Cincinnati, Ohio.
Shepard Hdw. Co., Buffalo, N. Y.
White Mountain Freezer Co., Nashua, N. H.
- Ice Picks.**
McLean Hdw. Mfg. Co., Worcester, Mass.
- Ice Shavers.**
Enterprise Mfg. Co., Philadelphia, Pa.
- Injectors.**
Jenkins Bros., New York.
Sherwood Mfg. Co., Buffalo, N. Y.
- Insurance, Boiler.**
Hazard Steam Boiler Inspection & Insurance Co.
- Iron and Steel, Swedish.**
Lundberg, Gustaf, Boston, Mass.
Milne, A. & Co., 1 Broadway, N. Y.
Page, Newell & Co., Boston, Mass.
- Iron Commission Brokers.**
Cason, Wm. B. & Co., Philadelphia.
Corning, Edw. & Co., 29 B'way, N. Y.
Cotton, Bradley & Co., Philadelphia.
Etting, Edw. J., Philadelphia.
Hogan, John L. & Co., Philadelphia, Pa.
Hoffman, J. W. & Co., Philadelphia.
Lewis, Henry & Co., Philadelphia.
Kearns, Jerome & Co., Philadelphia.
Lea, J. Tammal & Co., Philadelphia.
Mohr, J. J., 480 Walnut, Philadelphia.
Mann, E. R. & Co., Philadelphia.
Pilling & Crane, Philadelphia, Pa.
Sibell, Geo. H. & Co., Chicago, Ill.
Wilhelm & Co., Harrisburg, Pa.
Wistard, L. & R. Co., Phila., Pa.
- Iron Ore.**
Naylor & Co., 45 Wall, N. Y.
Pickands, Brown & Co., Chicago, Ill.
Pullman, J. Wesley, Phila., Pa.
- Iron, Merchants.**
Barnes, C. K. & Co., Philadelphia, Pa.
Borden & Lovell, Co., West, N. Y.
Busenius & Cunliffe, Philadelphia.
Corning Edw. & Co., 29 B'way, N. Y.
Cox, Justice, Jr., Philadelphia.
Cotton, Bradley & Co., Philadelphia.
Hoffman, J. W. & Co., Philadelphia.
Judson, B. F., 457 Water, St., N. Y.
Leonard, B. F. & West, N. Y.
Navior & Co., 45 Wall St., N. Y.
Nicolls, Wheeler & Co., Philadelphia.
Ogden & Wallace, 85 Elm St., N. Y.
Page, Newell & Co., Boston, Mass.
Pickards, Brown & Co., Cleveland, O.
Pierson & Co., 24 W. Water, N. Y.
Richards, J. W. & Co., 88 Chambers, N. Y.
Wallace, Wm. H. & Co., Albany & Washington streets, N. Y.
Whitney, A. R. & Co., 17 B'way, N. Y.
Wilson, E. H. & Co., Philadelphia.
- Iron, Importers.**
Abbott, Jere & Co., N. Y. and Boston.
Judson, B. F., 457 Water, St., N. Y.
Lundberg, Gustaf, Boston, Mass.
- Iron, Sheet, Manufacturers of.**
Atma Iron & Steel Co., Bridgeport, O.
Cambridge Iron & Steel Co., Cambridge, Ohio.
Wheeling Steel & Iron Co., Wheeling, W. Va.
- W. Dewees Wood Co., Ltd., Pittsburgh.**
- Ironwork, Ornamental.**
Barnum, E. T., Detroit, Mich.
Champion Iron Co., Kenton, O.
Field-Lang Wire & Metal Co., St. Louis.
Ludlow-Saylor Wire Co., St. Louis, Mo.
Mast, Fogs & Co., Springfield, O.
Sewell & Bibb, Louisville, Ky.
The Van Dorn Iron Works Co., Cleveland, O.
- Joist Leveler.**
Columbia Mfg. Co., Cincinnati, O.
- Keys.**
Wollensak, J. F., Chicago, Ill.
- Ladders.**
Detroit Fdy. Equipment Co., Detroit, Mich.
- Lamps.**
Standard Lighting Co., Cleveland, O.
- Lanterns.**
Dietz, R. E. & Co., 60 Laight St., N. Y.
Steam Gauge & Lantern Co., Syracuse, N. Y.
- Lathes.**
Finney & Rhodes, Hartford, Conn.
Millers Haus Co., 38 Nassau, N. Y.
Sebastian Lathe Co., Cincinnati, O.
Sebastian, May & Co., Sidney, O.
Seneca Falls Mfg. Co., Seneca Falls, N. Y.
- Lathing.**
Clinton Wire Cloth Co., St. Louis, Mo.
N. J. Wire Cloth Co., Trenton, N. J.
- Lawn Mowers.**
Bingham, W. Co., Cleveland, O.
Blair Mfg. Co., Springfield, Mass.
Chadborn & Coldwell Mfg. Co., New York, N. Y.
Champion Mfg. Co., Richmond, Ind.
Coldwell Lawn Mower Co., Newburg, N. Y.
F. & N. Mfg. Co., Richmond, Ind.
Foss, G. S. Co., Springfield, Mo.
Henley, E. C., Richmond, Ind.
Lamb, W. E., Syracuse, N. Y.
Mast, Fogs & Co., Springfield, O.
Stearns, E. C. & Co., Syracuse, N. Y.
Supply Hdw. Co., Phila., Pa.
Surplus, Dunn & Alder, 97 Chambers St., N. Y.
Wilson Whiteley & Co., Springfield, O.
Lawn Rakes.
Gibbs Mfg. Co., Canton, O.
- Graham, John H. & Co., 111 Chambers St., New York.**
- Lawn Sprinklers.**
Blair Mfg. Co., Springfield, Mass.
Ette & Henger Mfg. Co., St. Louis, Mo.
- Lawn Sweepers.**
Lape, W. E., Syracuse, N. Y.
- Lemon Squeezers.**
Ripley Mfg. Co., Unionville, Conn.
- Letter Boxes.**
Merriam Mfg. Co., Durham, Conn.
- Letters.**
Tablet & Ticket Co., Chicago, Ill.
- Levels.**
Richardson, C. F. & Son Athol, Mass.
- Locks & Knobs, Manufacturers of.**
Brittan Graham & Mathes Pittsburgh, Pa.
Deitz, A. E., 97 Chambers, N. Y.
Reading Hdw. Co., Reading, Pa.
Romer & Co., Newark, N. J.
Russell & Erwin Mfg. Co., N. Y. City.
Sargent & Co., 37 Chambers St., N. Y.
Smith & Egge Mfg. Co., Bridgeport, Warner Lock Co., Chicago, Ill.
Yale & Towne Mfg. Co., Stamford, Conn.
- Lumber, Dealers.**
Lunkenheimer Co., Cincinnati, Ohio.
- Machinery.**
Am. Tool Works, Cleveland, Ohio.
Barnes, W. F. & John, Rockford, Ill.
Becker, Jno. Mfg. Co., Fitchburg, Mass.
Bement, Miles & Co., Philadelphia, Pa.
Bertsch & Co., Cambridge City, Ind.
Bigelow, C. E., 40 Der, N. Y.
Bignall & Keeler Mfg. Co., St. Louis.
Birmingham Iron Foundry, Birmingham, Conn.
Bliss, E. W. Co., Brooklyn, N. Y.
Briggs, Marvin, 12 Broadway, N. Y.
Brown & Sharpe Mfg. Co., Providence, R. I.
Carlin's Sons, Thos. Allegheny, Pa.
Clapp, Geo. M., agt., 74 Cortlandt, N. Y.
Coulter & McKensie Mch. Co., Bridgeport, Conn.
Cruikshank, D. B., Providence, R. I.
Davis, W. P., Rochester, N. Y.
Detrick & Harvey Mch. Co., Baltimore, Md.
Finney & Rhodes, Hartford, Conn.
Fitchburg Mch. Works, Fitchburg, Mass.
Garvin Mch. Co., Laight & Canal Sts. Gould & Eberhardt, Newark, N. J.
Harrington, E. Son & Co., Phila., Pa.
Henderson Machine Tool Co., Phila., Pa.
Henderson Machine Co., Torrington, Ct.
Henley Mch. Tool Works, Richmond, Ind.
Hill, Clarke & Co., Boston, Mass.
Ingersoll Milling Machine Co., Rockford, Ill.
Johnson, Israel H., Jr., & Co., Phila.
Jones & Lamson Mch. Co., Springfield, Vt.
Lodge & Davis Mch. Tool Co., Cincinnati, O.
Lodge & Shipley Mch. Tool Works, Cincinnati, O.
Lovegrove & Co., Philadelphia, Pa.
McCabe, J. J., 68 Cortlandt, N. Y.
Machinists Supply Co., Rochester, N. Y.
Manville, E. J. Mch. Co., Waterbury, Conn.
National Machinery Co., Timb. Ohio.
Newark Mch. Tool Works, Newark, N. J.
New Haven Mfg. Co., New Haven, Conn.
New York Mach'ry Depot, N. Y.
Niles Tool Wks., 138 Liberty St., N. Y.
Pedrick & Ayer, Philadelphia, Pa.
Pittsburgh Mfg. Co., Pittsburgh, Pa.
Place, Geo., 120 Broadway, N. Y.
Poole, Robt. & Son Co., Baltimore, Md.
Powell Planer Co., Worcester, Mass.
Prestis & Whitney Co., Hartford, Conn.
Prentiss Tool & Supply Co., N. Y.
Scranton Supply & Mach'ry Co., Scranton, Pa.
Sellers, Wm. & Co., Phila.
Seyfert's Sons L. F., Philadelphia, Pa.
Stepoe, J. & Co., Cincinnati, O.
Stow Flexible Shaft Co., Ltd., Phila.
Toomey, Frank, Philadelphia, Pa.
Wetherill, Robert & Co., Chester, Pa.
Wilson, W. A., Rochester, N. Y.
Woodruff Mfg. Co., Hartford, Conn.
- Machinery for Hardware Manufacturers.**
Add, Jno. & Son, New Haven, Conn.
- Machine Knives.**
Loring Coes & Co., Worcester, Mass.
Loyd, John, 558-562 Water St., N. Y.
- Machine Tools.—See Machinery.**
- Machine Works.**
Angus, C., Albany, N. Y.
- Machinists' Stools.**
Coffin & Leighton, Syracuse, N. Y.
Starrett, L. S., Athol, Mass.
- Machinists' Tools and Supplies.**
Brown & Sharpe Mfg. Co., Providence.
Sellers, Wm. & Co., Inc., Phila.
- Mach'ry Mallet & Handle Works, N. Y.**
- Mangers.**
Worthley's Broad Gauge Iron Stall Works, Boston, Mass.
- Measuring Tapes.**
Curlin Rule Co., Saginaw, Mich.
- Meat Cutters.**
Enterprise Mfg. Co., Philadelphia, Pa.
- Metals.**
Fearling, Wm. S., 100 Chambers, N. Y.
Hendricks Bros., 49 Cliff, N. Y.
Naylor & Co., 45 Wall, N. Y.
Simpers, Collins & Co., Phila., Pa.
- Metal Brokers.**
American Metal Co., N. Y.
- Metalburgists.**
Britton, J., Blodgett, Phila.
- Metal Saws.**
Ehrhardt, Gastave & Sons, Pittsburgh & C. Co., Chicago, Ill.
- Milling Machines.**
Ingersoll Milling Machine Co., Rockford, Ill.
- Mining Knives.**
Palmer Hdw. Mfg. Co., Troy, N. Y.
- Mine Lamps.**
Darby, Edw. & Sons Phila., Pa.
Leonard, B. E., Scranton, Pa.
Leonard, T. F., Scranton, Pa.
- Mining Machinery.**
Frazier & Chalmers, Chicago, Ill.
Gates Iron Wks., Chicago, Ill.
- Mining Screens.**
Harrington & King Perforating Co., Chicago, Ill.
- Howard & Morse, 45 Fulton, N. Y.**
- Minnow Traps.**
Wilson, Ed. C., Olney, Ill.

- Molding Sand.**
Chicago Foundry Supply Co., Chicago, Ill.
Obermayer, S. Co., Cincinnati, O.
Parson, J. W. & Co., Phila.
Whitehead Bros. Co., 117 W. 15th St. N. Y.
- Motors, Water and Electric.**
Beiknap Motor Co., Portland, Me.
- Nail Keg Heading.**
Pittsburgh Mfg. Co., Pittsburgh Pa.
- Nails (Cut) and Spikes.**
Borden & Lovell, 70 West, N. Y.
Cumberland Nail and Iron Co., Phila.
Oxford Iron Co., 81 Washington, Y.
Pottstown Iron Co., Pottstown, Pa.
Riverside Iron Works, Wheeling, W. Va.
- Stebbins, C. J., 108 Reade, N. Y.
- Nickel Platers' Supplies.**
Eddy Electric Mfg. Co., Windsor, Conn.
Hanson & Van Winkle Co., Newark, N. J.
Zucker & Levett Chemical Company, 10 to 14 Grand St., N. Y.
- Norway Shapes, Rollers of.**
Bowland, William & Harvey, Freeport, Philadelphia
- Nut Machine.**
Dunham Nut Mch. Co., Unionville, O.
- Nuts, Bolts, &c., Makers of.**
American Bolt Co., Lowell, Mass.
American Screw Co., Providence, R. I.
Blake & Johnson, Waterbury, Conn.
Haskell, Wm. H. Co., Pawtucket, R. I.
Port Chester Nut and Nut Co., Chester, N. Y.
Russell, Burdall & Ward, Port Chester, Rhode Island Tool Co., Providence, R. I.
Sternbergh, J. H. & Son, Reading, Pa.
Wilson, J. Fred, Worcester, Mass.
Wm. H. Haskell Co., Pawtucket, R. I.
- Oil Cans and Lubricators.**
Sherwood Mfg. Co., Buffalo, N. Y.
- Oil and Grease Cans.**
Lunkenheimer Co., Cincinnati, Ohio.
- Oilers.**
Hammer & Co., Branford, Conn.
- Oil Station.**
Pike Mfg. Co., Pike Station, N. H.
- Orange Shears.**
Henry J. T. Mfg. Co., Hamden, Conn.
- Orn Sampling Machines.**
Fraser & Chalmers, Chicago, Ill.
- Ores.**
Walter, Francis, Philadelphia, Pa.
- Ox Shoes.**
Scranton Forging Co., Scranton, Pa.
Woodruff, Walter W. & Sons, Mt. Carmel, Conn.
- Packing.**
N. Y. Belting & Packing Co. Ltd., N. Y.
Billington, Jas. H. & Co., Phila., Pa.
- Paddock.**
Ames Sword Co., Chicopee, Mass.
Fram, E. T., Lancaster, Pa.
Hillebrand & Wolf, Phila., Pa.
Miller Lock Co., Philadelphia, Pa.
- Paint.**
Detroit Graphite Mfg. Co., Detroit, Mich.
Dixon, Jos. Crucible Co., Jersey City, N. J.
Garry Iron & Steel Roofing Co., Cleveland, O.
- Pain Burners.**
Dangler Stove & Mfg. Co., Cleveland, O.
- Pans, Sifters.**
Ashley, J. A., Washington, D. C.
Fitzgerald, S. C., Washington, D. C.
Gooch, C. J., Washington, D. C.
Howson & Howson, Phila. & Wash'ton.
Jenner, H. W. T., Washington, D. C.
Faine & Ladd, Washington, D. C.
Stocking, E. B., Washington, D. C.
Peanut & Coffee Roasters.
Olson, A. B., Kansas City, Mo.
- Perforated Metal.**
Clinton Wire Cloth Co., Clinton, Mass.
Harrington & King Perforating Co., Chicago, Ill.
- Phosphor Bronze.**
Phosphor Bronze Smelting Co., Limited, 612 Arch, Philadelphia.
- Phosphor Tin.**
Crescent Phosphorized Metal Co., Philadelphia, Pa.
Crosby Steam Gauge & Valve Co., Boston, Mass.
- Picks and Mattocks.**
Plumb, Fayette K., Philadelphia, Pa.
- Pig Iron.**
Houston, C. B. & Co., Philadelphia, Pa.
Mann, Edwin R., Philadelphia, Pa.
Montour Iron & Steel Co., Danville, Pa.
Naylor & Co., 46 Wall, N. Y.
Pickands, Brown & Co., Chicago, Ill.
Pilling & Crane, Philadelphia, Pa.
Wheeling Steel & Iron Co., Wheeling, W. Va.
- Pig Iron Storage.**
Am. Pig Iron Storage Warrant Co., 44 Wall, N. Y.
- Pipe Drivers.**
Vulcan Iron Wks., Chicago, Ill.
- Pipe, Bent.**
National Pipe Bending Co., New Haven
- Pipe Cutting and Threading Machines.**
Signal & Keeler Mfg. Co., St. Louis, Mo.
Pancoast & Maule, Philadelphia.
- Pipe Grips.**
Frederick Vise Co., 44 Barclay, N. Y.
- Pipes, Fittings, &c., Makers of.**
McNab & Harlan Mfg. Co., N. Y.
- Pipe, Water and Gas, Makers of.**
Cumberland Nail and Iron Co., Phila., Pa.
Donaldson Iron Co., Emmaus, Pa.
Riverside Iron Works, Wheeling, W. Va.
- Wood, R. D. & Co., Phila.
- Plane Irons, Manufacturers of.**
Buck Bros., Millbury, Mass.
- Planes, Manufacturers of.**
Stanley Rule & Level Co., N. Y.
- Plate Bending Rolls.**
Schneekloth, H. A., 530 W. 28th St., N. Y.
- Plate, Iron and Steel, Mfrs of.**
Wood Alan Co., Philadelphia
- Plum and Steel Co., Bridgeport, O.**
Lukens Iron & Steel Co., Coatesville, Pa.
Moorehead-McLean Co., Pittsburgh, Pa.
McIlwain & Sons, Reading, Pa.
Pottstown Iron Co., Pottstown, Pa.
Pottsville Iron & Steel Co., Pottsville, Pa.
- Singer, Nimick & Co., Pittsburgh, Pa.**
The Mahoning Valley Iron Co., Youngstown, O.
Wellman Iron & Steel Co., Thurflow, Pa.
- Alan Wood Co., Philadelphia.**
Plating, Nickel, Brass and Silver.
Angus, C. H. Albany, N. Y.
Shepard Hdw. Co., Buffalo, N. Y.
Wilmot & Hobbs Mfg. Co., Bridgeport, Conn.
- Plumbago.**
Chicago Fdy. Supply Co., Chicago, Ill.
- Polishing Machines.**
Watson & Stillman, 204 E. 43d, N. Y.
- Polishing Wheel.**
La Massena, C. E. & Co., Newark, N. J.
- Post Hole Diggers.**
Buckeye Mfg. Co., Union City, Ind.
Gibbs Mfg. Co., Canton, Ohio.
Graham, John H. & Co., 113 Chambers St., New York
- Wister, L. R. & Co., Philadelphia, Pa.
- Poultry Nettings.**
Barium, E. T., Detroit, Mich.
Gilbert & Bennett Mfg. Co., 42 Cliff St., N. Y.
N. J. Wire Cloth Co., Trenton, N. J.
"Silver Finish."
Wright & Colton Wire Cloth Co., Worcester, Mass.
- Powder.**
Lafin & Rand Powder Co., 29 Murray New York Powder Co., 62 Liberty St., N. Y.
- Powder Hammers.**
Bradley & Co., Syracuse, N. Y.
Belden Mach. Co., New Haven, Conn.
Dienelt & Eisenhardt, Philadelphia
- Dupont Mfg. Co., St. Johnsbury, Vt.
Hackney Hammer Co., Cleveland, O.
Jenkins & Lingie, Bellefonte, Pa.
- Powder Punches and Shears.**
Eaton, Geo. H. & Co., Boston, Mass.
Ferracute Mfg. Co., Bridgeton, N. J.
- Presses, Rollers of.**
E. W. Bliss Co., Brooklyn, N. Y.
Crosby, G. A. & Co., Chicago, Ill.
Ferracute Mch. Co., Bridgeton, N. J.
Stiles & Parker Press Co., Brooklyn, N. Y.
- Presses, Power, Makers of.**
Bliss, E. W. Co., Brooklyn, N. Y.
Eaton, Geo. H. & Co., Boston, Mass.
Manville, E. J. Mch. Co., Waterbury, Ct.
Merriman, A. H., West Meriden
- Stark Mch. & Tool Co., Buffalo, N. Y.
Waterbury Farrel Foundry and Machine Co., Waterbury, Conn.
- Pulley Fixings.**
Riley, J. W. & Co., Cincinnati, O.
- Pulleys.**
Allfree, J. B. Mfg. Co., Indianapolis, Ind.
Great Western Pin Co., Toledo, O.
Reeves Pulley Co., Columbus, O.
- Pulverizing Mill.**
Bradley Pulverizer Co., Boston, Mass.
- Pump Governors.**
Johnson T. M. New London, Conn.
- Pumping Machinery.**
Dean Bros. Steam Pump Works, Indianapolis, Ind.
Hooker-Corville Steam Pump Co., Chicago, Ill.
McGowan, J. H. & Co., Cincinnati, O.
Maslin, J. & Son, Jersey City, N. J.
Norwalk Iron Wks. Co., So. Norwalk, Conn.
- Southwark Fdy. & Mch. Co., Phila., Pa.**
Valley Pump Works, Easthampton, Mass.
- Pumps, Makers of.**
Bellevue Pump Co., Bellevue, Iowa.
Deming Co., Salem, O.
Douglas, W. B., Middletown, Conn.
East, F. O. & Co., Springfield, O.
Myers, F. E. & Bro., Ashland, O.
St. Joseph Mfg. Co., St. Joseph, Mo.
- Punches and Shears, Hand and Power.**
Cleveland Hdw. Co., Cleveland, O.
New Doty Mfg. Co., Janesville, Wis.
Stark Mch. & Tool Co., Buffalo, N. Y.
- Punching and Shearing Presses.**
E. W. Bliss Co., Brooklyn, N. Y.
Cockburn Barrow & Mch. Co., Jersey City, N. J.
Crosby, G. A. & Co., Chicago, Ill.
Schneekloth, H. A., 530 W. 28th St., N. Y.
Stiles & Parker Press Co., Brooklyn, N. Y.
- Wals & Roos, Punch & Shear Co., Cincinnati, Ohio
- Waterbury Farrel Foundry and Mch. Co., Waterbury, Conn.
- Watson & Stillman, 204 E. 43d, N. Y.
- Rails, Old and New.**
Birch, L. K., Chicago, Ill.
Perry, W. H. & Co., Providence, R. I.
Richards, R. & Co., Pittsburgh, Pa.
- Railway Supplies.**
Scully-Castle Co., Chicago, Ill.
- Rat and Mouse Traps.**
Burditt & Williams, Boston, Mass.
Estey, W. S., 65 Fulton, N. Y.
Ripley Mfg. Co., Unionville, Conn.
Waddell, J. M. Mfg. Co., Greenfield, O.
- Razors.**
Butcher, W. S., 135 Duane St., N. Y.
Curley, J. & Bro., 6 Warren St., N. Y.
Electric Cutlery Co., 113 Chambers, N. Y.
Schmitz, E. Lothar, 92 Reade St., N. Y.
Southington Cutlery Co., Southington, Conn.
- J. R. Torrey Razor Co., Worcester, Mass.
- Recording Pressure Gauges.**
Bristols Mfg. Co., Waterbury, Conn.
- Refrigerators.**
Pierce, Geo. N. & Co., Buffalo, N. Y.
- Refrigerator Door Fasteners.**
Conroy, P. J. & Co., Philadelphia
- Rivets.**
Blake & Johnson, Waterbury, Conn.
Cobb & Drew, Plymouth, Mass.
Henderson, Jas S., 165 Greenwich, N. Y.
Perkins, D. W., Hartford, Conn.
Plymouth Mills, Plymouth, Mass.
Sternbergh, J. H. & Son, Reading, Pa.
Townsend, W. P. & Co., New Brighton, Pa.
- Riveting Machines.**
Adt. Jno. & Sons, New Haven, Conn.
- Roasters and Bakers.**
Matthai, Ingram & Co., Baltimore, Md.
- Rock Breakers.**
Gates Iron Works, Chicago, Ill.
- Rock Drills.**
Fenna, Leonard Drill & Mfg. Co., Hirdsboro, Pa.
Rand Drill Co., 23 Park Place, N. Y.
- Rolling Mill Machinery.**
Birmingham Iron F'dry, Birmingham, Conn.
Booth, The Lloyd, Co., Youngstown, O.
- Leechburg Foundry & Mch. Co., Pittsburgh, Pa.**
Mahoning F'dry & Mch. Co., Danville, Pa.
Morgan Construction Co., Worcester, Mass.
Robinson-Rea Mfg. Co., Pittsburgh.
Totterd Hogg Iron and Steel F'dry Co., Pittsburgh, Pa.
Waterbury Farrel Foundry & Mch. Co., Waterbury, Conn.
- Roll Lathes.**
Totterd & Hogg Iron & Steel F'dry Co., Pittsburgh, Pa.
- Rolls, Chilled, Sand and Steel.**
Booth, The Lloyd, Co., Youngstown, O.
Chicago Foundry Co., Chicago, Ill.
Garrison, A. & Co., Pittsburgh, Pa.
Johnson Foundry Co., Johnstown, Pa.
Seaman, Sleeth & Black, Pittsburgh.
Totterd & Hogg Iron and Steel F'dry Co., Pittsburgh, Pa.
- Roofing.**
Berlin Iron Bridge Co., E. Berlin, Conn.
Boston Bridge Works, Boston, Mass.
Cambridge Roofing Co., Cambridge, O.
Cincinnati Corrugating Co., Piqua, O.
Johns, H. Mfg. Co., 87 Maiden Lane
- Roofing Slates.**
Auld & Conger, Cleveland, O.
- Rope.**
Travers Bros. Co., 107 Duane St., N. Y.
- Rope and Web Goods.**
Cover Mfg. Co., West Troy, N. Y.
Cover's Saddlery Wks., Farmer, N. Y.
- Rubber Goods.**
Canfield, H. O., Bridgeport, Conn.
- Rules, Manufacturers of.**
Larkin Rule Co., Saginaw, Mich.
Stanley Rule & Level Co., 29 Chambers, N. Y.
- Sad Irons.**
Sad Iron Co., Milwaukee, Wis.
- Sand Paper.**
Baeder, Adamson & Co., Phila., Pa.
- Sash Balances.**
Caldwell Mfg. Co., Rochester, N. Y.
Coleman Hdw. Co., Chicago, Ill.
Hugunin, R. E., W. F. Mfg. Co. Hartford, Conn.
- Fullman Sash Balance Co., Rochester, N. Y.
- Stewart & Baker, Rochester, N. Y.
- Sash Cords and Chains.**
Morton, Thos., 65 Elizabeth, N. Y.
Ossawan Mills Co., Norwich, Conn.
Samson Cordage Works, Boston, Mass.
Smith & Egge, Mfg. Co., Bridgeport, Conn.
- Tate & Co., Malden, Mass.
- Sash Holders.**
Motley, Peter, Philadelphia, Pa.
- Sash Locks.**
Champion Safety Lock Co., Cleveland, Ohio
- Ives, E. B. & Co., New Haven, Conn.
- Sash Pulleys.**
Empire Portable Forge Co., Lansingburgh, N. Y.
- Palmer Hardware Mfg. Co., Troy, N. Y.
- Sash Weights.**
Brown, E. E. & Co., Philadelphia, Pa.
- Sawing Machines.**
Atkins, E. C. & Co., Indianapolis, Ind.
Diakon, Henry & Sons, Phila., Pa.
Jennings, C. E. & Co., 97 Chambers, N. Y.
National Saw Co., 98 Reade St., N. Y.
Richardson Bros., Newark, N. J.
Simmonds Mfg. Co., Fitchburg, Mass.
- Saw Saws.**
Kohler, F. E. & Co., Canton, Ohio.
Taintor Mfg. Co., 84-86 Chambers, N. Y.
Lloyd, W. J. Mfg. Co., Phila., Pa.
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Chastillon, John & Sons, 85-89 Cliff, N. Y.
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Kiley, W. Co., Greenville, O.
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Phillips, A. J. & Co., Fenton, Mich.
Queen Anne Screen Co., Burlington, Vt.
- Screen Wire Holders.**
Hosford, Jno., Monroeville, O.
- Screw Cutting Machinery.**
W. & H. Russell Co., Greenfield, Mass.
- Wiley & Russell Mfg. Co., Greenfield, Mass.
- Screw Drivers.**
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Capitol Mfg. Co., Chicago, Ill.
Chantrell Tool Co., Reading, Pa.
Gibbs & Parsons, Augusta, Me.
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- Screw Plate and Pipe Cutter.**
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Reynolds & Co., New Haven, Conn.
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- Screw Saws.**
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Etna Iron & Steel Co., Bridgeport, O.
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Belleville Steel Co., St. Louis, Mo.
Carnegie Steel Co. Ltd., Pittsburgh, Pa.
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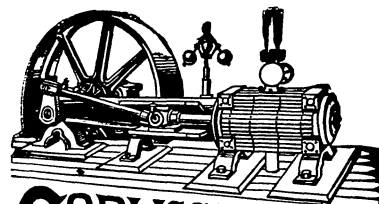
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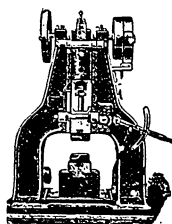
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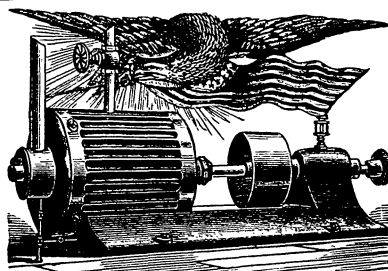
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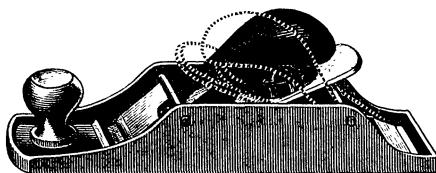
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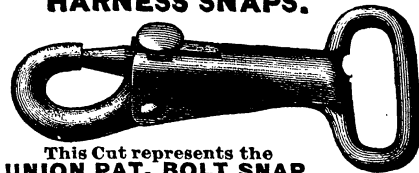
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This Plane has two slots, and two cutter seats. It can be used as a Block Plane; or, by reversing the position of the cutter and the clamping wedge (see dotted lines in the engraving), it can be used to plane close up into corners, or places difficult to reach with any other plane.

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TOOL CABINET.

See Page 80.

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Send for Catalogue and Price List.



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Solid Box Vises

Will find it profitable to send us
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Van Wagoner & Williams Co.,

Cleveland, Ohio and 14 Warren Street,
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SUCCESSORS TO

Trenton Vise & Tool Works.

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New York.

THE IRON AGE

THURSDAY, FEBRUARY 2, 1893.

The Shaw 80-Ton Gantry and Transfer Crane.

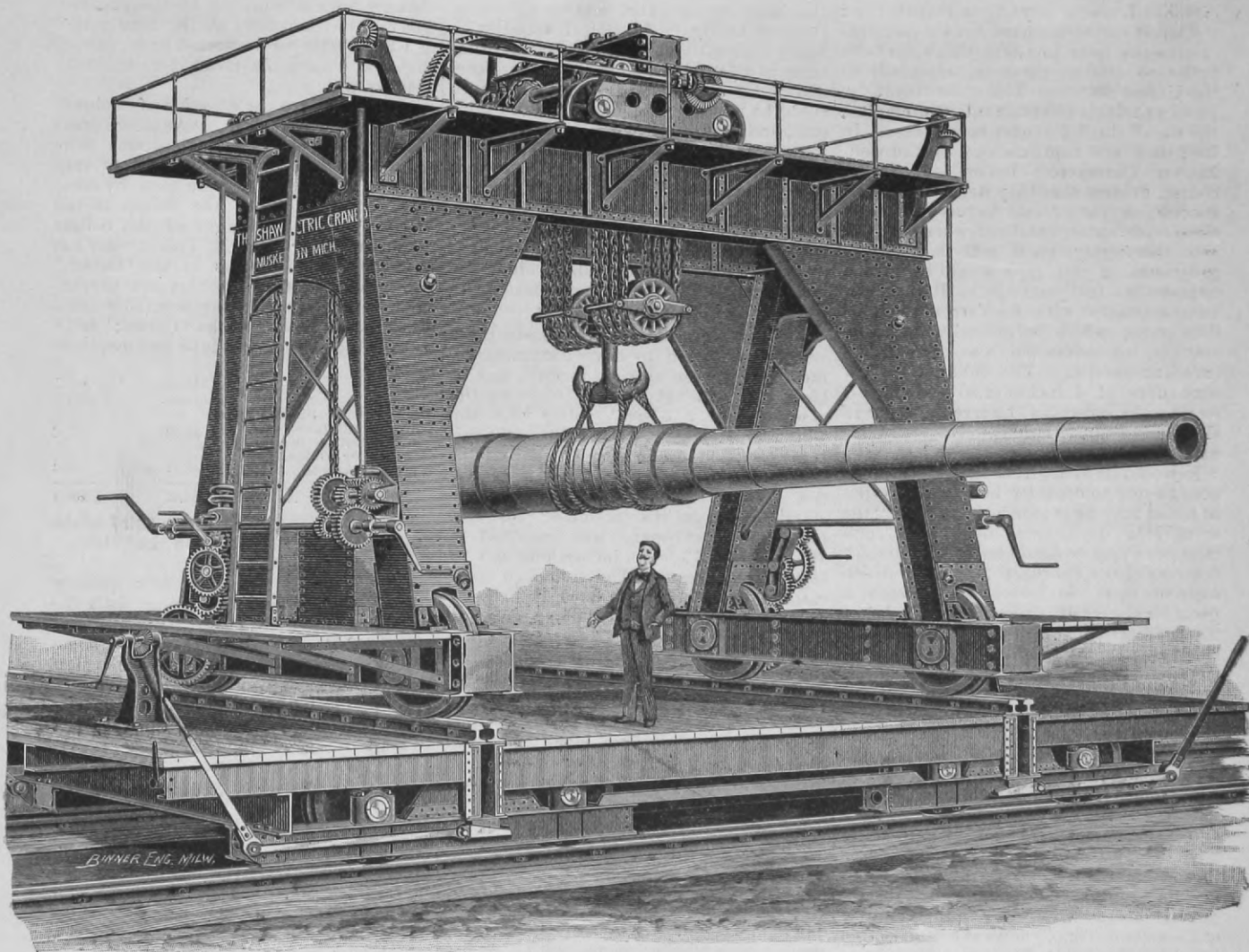
The appliances for mounting and dismounting heavy guns at the Sandy Hook proving ground have until recently been of the crudest character, and, although the need of something better had been for a long time realized, no actual step in the direction of improvement had been taken until the summer of 1891, when the department advertised for proposals for an

but also the number of "reductions" and consequently lowered the efficiency.

The fall consists of 16 strands of $1\frac{3}{16}$ inch chain running over two 6-pocketed chain wheels, one overhauling either end, so that the chain ratio is 8 to 1. The free ends of the chain pass over idlers at one end of the gantry and drop into chain boxes located between the legs at the level of the operating platform.

The hoisting train is supplied with four cranks, two at either end of the gantry, so arranged as to accommodate 12 or 16

with anti-friction roller bushings. The chain sheaves are of large diameter, 30 inches, and are turned. All gears are cut and bevel gears are planed to theoretically correct shapes on a Bilgram planer. The treads of all truck wheels are chilled hard and deep and ground true by special machinery. The hook is carried on hardened steel conical rolls running between hardened steel plates, all ground true. The same careful workmanship is apparent on all parts of the machine. The framing throughout is of steel. In assembling,



THE SHAW 80-TON HAND GANTRY AND TRANSFER TABLE.

80-ton gantry and transfer table, the designs to be submitted by the bidders. The accepted design was that of the Shaw Electric Crane Company of Muskegon, Mich., to whom, through their agents, Manning, Maxwell & Moore, New York, the contract was awarded.

The gantry proper is of 17 feet span and has a clear hoist of 15 feet.

The general specifications provided that all movements should be operated by hand from the ground or from platforms near the ground level. The essential features of the design consisted in locating the hoisting mechanism on the trolley and carrying the power thereto by shafts and suitable gearing. The same considerations led to the adoption of pocketed chain wheels and pitch chain instead of drums, which would not only have increased the weight and bulk of the parts to be moved

men. There is one change of gearing ratio to provide for the rapid handling of light loads.

The gantry is traversed by cranks at either end operated from the same platform as the hoisting cranks, as also is the racking or trolley movement.

In order to allow the use of gantry in the different traverses there is provided a transfer table running on tracks in a trench at the rear of and parallel to the traverses.

The transfer table is carried on eight double tread wheels, each 42 inches in diameter. It is provided with locking bolts and wedges to insure its proper location and prevent settlement of the rail ends as the gantry is run on and off the table.

The workmanship of this gantry is of a high order for a machine of this class. All sheaves and important bearings are fitted

great care was taken in riveting and nearly all bolts are fitted to reamed holes.

Congressman Harter of Ohio last week introduced in the House a bill for the suppression of trusts, which directs the Secretary of the Treasury, upon satisfactory proof that the manufacture, distribution, price or terms of sale of any article of general consumption is practically under the control or direction of a trust or combine, to make the article free of duty and cancel all patents relating to it.

The grand jury in the City of Rochester indicted the members of the local coal exchange on the charge that these men "conspired together for the purpose of preventing free competition in the sale of coal among the consumers of the city."

A Danish Naval Trial of Water Tube Boilers.

A peculiar interest attaches to the recent steam trials of the new Danish cruiser "Geiser," owing to the fact that this vessel has no shell boilers, the experiment having been tried of equipping her with a larger number of Thornycroft boilers than had hitherto been used in combination. Judging from the published report of the trials, this attempt to employ, on a large scale for marine purposes, the type of water-tube boiler named seems to have been entirely successful. The very satisfactory results obtained will probably strengthen the present tendency in the direction of adopting water-tube boilers for use on board ship.

Referring to this tendency, *The Engineer* of London, says in a recent issue: "Earnest endeavors have been made during the past year to adapt the water-tube boiler to marine purposes, especially in the United States. The more recent departures in this direction all contemplate the use of small diameter bent tubes. In fact, they are modifications of the well-known Thornycroft boiler. It is, of course, evident that they depend for their success on three main factors—perfectly clean fresh water, excellent workmanship, and thoroughly good material. Steam generators of this type would have been impossible a few years ago. It must not be confounded with the Yarrow straight-tube type, which is radically different, and has, we understand, also been giving excellent results. The tubulous boiler, with tubes of 4 inches or so in diameter, seems to be especially reserved for use in electric light installations. It has so far been a failure when tried at sea."

It would be apart from the present purpose to stop to consider here which types of boiler may be properly classified as "the more recent departures," or whether such later ones may be justly termed mere modifications of the Thornycroft boiler to which some of them do undoubtedly present a great similarity in appearance. The first Thornycroft boiler was fitted on board a small steamboat in 1883. Taking water-tube boilers as a general class, however, mention may be made of several prominent types.

The Belleville boiler has been in use in the French Navy since 1879. In spite of a report made in 1880, which was adverse to it in some respects, practical experience with the Belleville boiler, both in the navy and in the merchant marine, appears to have demonstrated its value, even for large vessels habitually making long passages, and its adoption for use in two fine passenger steamers now building in this country, at Cleveland, Ohio, shows the high esteem in which it is held. The new coast defence vessel "Monterey" of the United States Navy has Ward boilers, an American invention, but does not depend upon this type entirely, being provided with shell boilers also. In the case of this vessel it was decided, in order to diminish the machinery weights, to use tubulous boilers for about three-fourths of her boiler power. Among additional types applicable to marine purposes may be named the Herreshoff, the Roberts, the Towne, the Cowles, and the Worthington boiler. Some of these have been in use in boats or in comparatively small vessels for years in this country, while others have come into notice recently.

The use of these various forms of water-tube boilers is, of course, due to the endeavor, which manifests itself in so many ways, to find a thoroughly satisfactory means of supplying the high steam pressures demanded by the marine engines of the present day, and at the same time accomplishing the important purpose of reducing the weights carried if possible.

The Thornycroft boiler has been used extensively in torpedo boats for some years, and while its record is not free from casualties it has given excellent results. In our own navy the torpedo-boat "Cushing" has this type of boiler. In the Danish Navy it was adopted several years ago for torpedo boats, as it was considered better than the locomotive boiler for these small vessels. After two years experience with them, the Director of Naval Construction of the Danish Navy stated that the Thornycroft boilers, as fitted in several torpedo boats, had given no trouble up to that time, and that steam could be raised in less than half an hour without risking any leakage by sudden variations in temperature. He added that they were found to be splendid steam generators, and that the air-pressure at full speed did not exceed 1 inch to 1½ inches in the large boats. The engines could be stopped suddenly from full speed with heavy fires without any consequent difficulty as to sudden rise in steam pressure, and on the other hand the steam pressure could be raised 100 pounds in a few minutes, and that no leakage at any tube or joint had occurred at any time. The boiler was not liable to priming, and the water surface was not disturbed or the heating surface uncovered by the rolling of the boat. Besides these advantages with regard to general working and management in service, it was considered that the water-tube boiler had demonstrated its possession of other good features.

Further experience during the past three years would seem to have confirmed the favorable opinion already formed, and to have led to the experiment of fitting the new cruiser "Geiser" solely with the Thornycroft boilers. According to *Engineering* of London, in which an account of her steam trials was published recently, the "Geiser" is a third class cruiser of about 1300 tons displacement. She was built at Copenhagen, was launched in 1891, and is 257 feet 6 inches long and 27 feet 6 inches beam. The estimated indicated horse power was 3000, which the engines exceeded by 157 horse-power on the forced-draft trial. The armament consists of rapid-fire guns. Torpedo equipment is provided, and there is a protective deck.

The "Geiser" has two sets of vertical triple-expansion engines, made at Copenhagen. The cylinders are 19 inches, 30 inches and 50 inches, by 18 inches stroke. She is a twin-screw vessel, there being two Thornycroft propellers having forged blades. The diameter of each screw is 8.5 feet and the pitch 7.59 feet.

The boilers are, however, the feature of chief interest in considering the trials. There are eight Thornycroft boilers, arranged in two boiler rooms, with four fire rooms and two smoke pipes. These boilers were made at the Royal Dockyard, Copenhagen, under an arrangement with Thornycroft & Co. The total tube surface is 12,000 square feet, and the total grate area 171 square feet.

The steam trials took place in October and November, 1892, in the Sound, at Copenhagen, and consisted of a six hours' coal consumption trial, an eight hours' sea-speed trial, and a four hours' full-power trial. The results obtained on the two first named trials are given in the published report, but may be omitted here. On the full power trial the steam pressure in the boilers was 177.6 pounds, the air pressure was 0.81 inch, the collective indicated horse-power was 3157, and the speed of the ship was 17.1 knots. The coal consumption on the full-power trial was as follows:

	Pounds.
Per hour in all boilers.....	5,895.
Per hour per indicated horse-power...	1.87
Per square foot grate area.....	34.5

The report of the Danish Director of Naval Construction, as quoted by *Engineering*, states that during the trials the boilers worked most excellently, and that steam was kept up with the greatest ease. The steam generating power could be regulated almost immediately to suit the steam consumption of the engines. At the end of the sea-speed trial the engines were forced up to 3314 indicated horse-power in a few moments, after having steamed more than 7½ hours with an air pressure of about 0.6 inch, and this high horse-power could be maintained with an air pressure of about 1 inch. When going full speed the engines were often stopped suddenly, and the ship could be brought up to full speed in a few minutes. The boilers were able to stand all sudden changes of temperature. They did not prime during the highest forcing nor during sudden changes in the working of the engines. The coal consumption, at the hourly rate of 1 87 pounds per indicated horse power, shows a remarkable result for a forced-draft trial.

With regard to the question of weights the official report says: "Another great advantage which the boiler possesses is its small weight as compared with ordinary boilers. This can best be seen by comparing the weight of the boilers in the 'Geiser' with the weight of the boilers in the cruiser 'Hekla.' This cruiser has exactly the same engines as the 'Geiser,' and its six cylindrical boilers are proportioned to the same horse-power (3000 indicated horse power, as the 'Geiser;,' both ships being of the same type and displacement.

	'Hekla.' Tons.	'Geiser.' Tons.
Boilers with pipes, feed pumps, uptakes, funnels, and all other fittings in the boiler rooms.....	120.2	96.8
Water in boilers.....	48.0	17.4
Totals.....	168.2	108.2

"Thus 60 tons, or over one-third of the total weight of the boilers in the 'Hekla,' are saved in the 'Geiser.'"

On a trial to ascertain how quickly steam could be raised, starting with the water in the boilers at a temperature of about 55° F. and with the gauge glasses three-fourths full, a steam pressure of 120 pounds was obtained in 41 minutes, and two minutes later, the engines being sufficiently warm to start them, the ship put to sea.

Manning, Maxwell & Moore, 111 and 113 Liberty street, New York, manufacturers and dealers in Railway and Machinists' Tools and Supplies, have increased their Western facilities largely by taking the premises at 56, 58 and 60 Canal street, Chicago, Ill., where they have a floor space of 60 x 96 feet, which will be occupied February 1. The entire management of this establishment will be in charge of J. R. Williams, a mechanical engineer who has long been associated with this house. A full line of Machine Tools will be carried in stock. In addition to the store they have provided a fine suite of offices. They have long had a Chicago connection, starting originally with headquarters in a room at a hotel. Several changes have been made from time to time, always in the way of enlargement, resulting in the present commodious quarters. The enterprises owned or controlled by this interest are the Ashcroft Mfg. Company, the Consolidated Safety Valve Company, Hayden & Derby Mfg. Company, Metropolitan Injectors; Tabor Mfg. Company, Molding Machines; Pond Machine Tool Company, Heavy Tools for Railroad and Machine Shops, and the Shaw Electric Crane Company. Eugene L. Maxwell of Manning, Maxwell & Moore, New York, was, at an annual meeting held January 21, elected vice-president of the Electric Crane Company, Muskegon, Mich.

The Springfield Automatic Knife Grinder.

The Springfield Emery Wheel Company of Bridgeport, Conn., have brought out a new pattern of a heavy automatic knife grinder, designed for grinding heavy shear blades, veneer, book trimming, paper mill and planing mill knives. The ways are flat on top, 2½ inches wide and planed on each side to an angle of 30°. The carriage is 19 inches wide, planed to fit the bed, with a gib on the front side which may be taken up as the wear will necessitate, and is driven by a worm and worm friction gear; this enables the operator to stop and start the carriage at any moment, independent of the speed of the emery wheel. The knife bar is mounted on a carriage arranged with an automatic cross feed and stopped so that after the knife is properly set and the machine started it will require

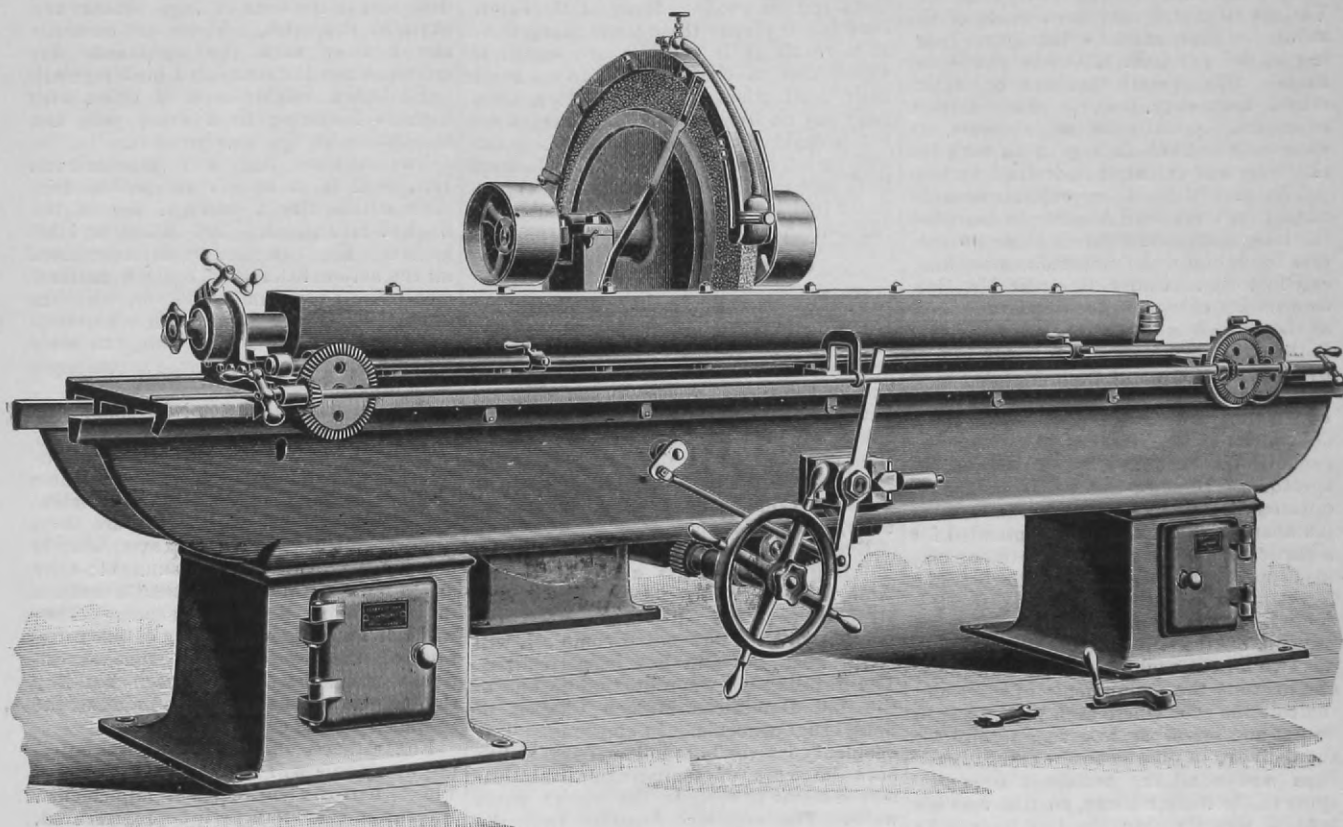
swivel head, so than any concave desired in the bevel of the knife may be obtained by swinging the emery wheel at an angle with the knife bar. Each machine is furnished with a pump which gives a good supply of water to keep from drawing the temper.

The floor space required is 5½ feet and governed by the length of machine that one might require, as they are made in different lengths, grinding a blade from 40 inches up to 144 inches in length, as occasion may require. The size of emery wheel spindles is 2½ inches; length of bearings 8 inches; size of pulleys on emery wheel spindles 10 x 5½ inches.

Street Railway Postal-Car Service in St. Louis.

In an appendix to the annual report of the Postmaster General for the fiscal year ending June 30, 1892, Postmaster John B.

a modern railway postal car. Its run is from Sixth and Locust streets westward to the city limits—about six miles—the schedule time being 40 minutes." There are three sub stations on this route, each with a number of carriers attached, the mail for whom is made up at the main office, leaving the clerk in charge of car free to handle and distribute mail received on the route. It is calculated that by the twelve carriers reporting at the sub stations instead of at the main office an aggregate saving of time is made to the extent of 10 hours daily. More sub-stations are to be placed on the line of the road with a number of accumulation street letter boxes at intervals, where carriers will deposit their collections. These boxes will be picked up by the car as it passes going either east or west. It would seem that this system might be very advantageously adopted in other cities in place of the far from speedy method of postal delivery and col-



THE SPRINGFIELD AUTOMATIC KNIFE GRINDER.

no further attention from the operator until the knife is ground. The knife bar is also arranged at the right hand end with a swivel box, and at the left hand end with a patent device for worm and worm gear, and a graduated dial to adjust the knife to any angle or bevel which may be desired. The emery wheel head is mounted on a short bed at right angles with the main bed, planed the same as the main bed of the machine and bolted to it, and having a box cabinet leg under the outside end. The emery wheel can be adjusted to the knife, as it wears down, by means of a screw.

These machines are made of three different styles of emery wheels, in order to suit the different classes of work which may be done by them. One style is a 36-inch diameter by 2-inch face, for grinding knives. Where a bevel is required without concaving the bevel, a cup wheel 16 inches in diameter with a 6-inch face and 2-inch rim may be applied. For grinding veneer knives a cup wheel 12 inches in diameter, 6-inch face and 2-inch rim is applied on a

Harlow of St. Louis, Mo., describes his application of the railway post office principle to street cars in that city; an innovation which appears to promise very satisfactory results in expediting the delivery and collection of mail. Mr. Harlow considers the new system destined to revolutionize the present methods of collections from street letter boxes, as well as the dispatch of city mail on the line of the road to carriers for delivery. The car used in St. Louis is described as follows: "The car is a miniature railway postal car, 20 feet long and the regulation width of a street car. It is run under the electric system with its own motor on front and rear platform, with motorman and conductor; sliding doors at each end and wide sliding doors with four windows on each side of car, with slot for mailing letters on each side bearing appropriate signs. The interior is well lighted with electric lights; the furniture, consisting of stove, letter case amply large enough for all distributing, a rack for sixteen sacks, a stamping table, and all the conveniences of

lection which at present obtains. The report does not state whether any steps have been taken to apply the St. Louis method to other districts.

The Channel Tunnel bill, to authorize resumption of work on the tunnel between Dover and Calais, will be again brought before the British Parliament at an early date. Great efforts are being made by the supporters of the scheme to carry the measure. The works, which were begun some years ago by a company organized by Sir Edward Watkin, were stopped by an order of the Board of Trade of England, after having proceeded for a few months. A difference of opinion exists as to the feasibility and desirability of the scheme; but the projectors are confident of their ability to carry out the undertaking, should government obstruction be removed.

New abattoir machinery and refrigerators to be constructed at Cincinnati will cost \$600,000.

WORLD'S FAIR NOTES.

The Work of Installation.

Preparations for putting exhibits in place are now complete. W. H. Holcomb, general manager of the little railroad in Jackson Park, has organized a force of employees for installation purposes, and is ready to handle displays as rapidly as they arrive. When these exhibits commence coming into the park Mr. Holcomb's railroad will probably do more business to the mile than any other line in the country.

It has become apparent during the week that the great volume of exhibits will pour into Jackson Park in two months, from February 15 to April 15. Isolated displays will arrive in small quantities before the middle of February and a few may be received later than April 15, but the great bulk of the displays will come to the park between the dates named. Various estimates have been made of the volume of these exhibits, the figures ranging all the way from 15,000 to 30,000 carloads. The quantity cannot be determined accurately, because many foreign countries, especially the larger powers, are extremely reticent in regard to both the character and extent of their displays.

The plan of installing exhibits brought out by the Council of Administration, after the long discussion between Director-General Davis and Chief Burnham, is working satisfactorily. Under this plan Mr. Holcomb takes charge of the displays as soon as they are switched into Jackson Park. If the exhibits have been properly passed by customs officials at ports of entry they are hauled directly to the buildings for which they are intended, otherwise they are taken to the custom house on the grounds and examined by a number of inspectors. Director-General Davis has requested, in order to simplify the work of installation, that all packages intended for a particular building be loaded in one car, in order to avoid extra handling. The forces under Colonel Davis and Mr. Holcomb are working in perfect harmony in putting exhibits in place. Mr. Holcomb has two men in each of the big buildings, one to study the assignments of space and indicate the spot where each package is to be put and the other to give a receipt for the delivery of the goods. Tracks have been laid in all the buildings from the spurs of the little railway, so that cars are pushed directly into the buildings. As soon as packages have been taken from trains and deposited on the space marked off for them on the floors Mr. Holcomb's duties end. His men withdraw and the exhibitor and department chief attend to the arrangement of displays.

Mr. Holcomb has issued instructions regarding the handling of goods that come to Jackson Park in wagons, drays or trucks instead of cars. These must be brought to the Sixty-fourth street gate. In order to preserve the boulevards and driveways which have been made at great cost, it is necessary to prescribe the width of tire for these wagons. One-horse vehicles must have tires 3 inches wide and tires of two-horse wagons must be 4 inches wide.

A toll of 6 cents per 100 pounds, with a minimum charge of 50 cents for any single shipment, is levied to pay the cost of putting exhibits in the buildings. Articles weighing more than 10,000 pounds and fragile packages are subject to additional charges. Each load of displays must be accompanied by a bill of lading, with specific information regarding the exhibitor's space number, name and weight of each article, total weight of shipment, name of building for which intended and separate bill of lading.

The exposition terminal charge will be collected at the scalehouse at Sixty-fourth street by an authorized representative of the exposition, who will deliver to the person in charge of the consignment a receipt in full for the amount collected. When exhibits are delivered to the building designated the person in charge of the exhibit must surrender the bill of lading to the superintendent, who will give him a receipt for the property delivered. Any person in charge of exhibits consigned to Jackson Park delivered by wagons, drays or trucks must present for inspection at the scale house a city weigher's certificate, giving the weight of the vehicle in his charge. In no case will exhibits be received for installation unless the rates quoted are paid at Sixty-fourth street entrance.

Intending exhibitors make a mistake in not prepaying all freight charges on their exhibits. The charges do not end at Chicago, but include the switching rate to Jackson Park and the additional charge of installing the goods. Many of the exhibitors fail to prepay these latter charges and as a result their exhibits are stored in warehouses in the city and do not reach their destination. The Exposition Company pay no freight. If the charges are not prepaid by the exhibitor his goods will be left somewhere outside of Jackson Park and much difficulty will be experienced in discovering just where the railroad company have side tracked his display.

California's Enterprise.

California seems to have entered into the work of preparing an exhibit for the exposition with a resolve to outdo all competitors. With a vim and vigor characteristic of the people of that State, displays have been prepared showing the varied resources of the empire west of the Rockies. In each of the great buildings space has been assigned to California, and the State Commissioners are now preparing to begin installation.

Even in the matter of preparing an office building California has aimed to excel. And those who have seen the unique structure near the Fifty-ninth street entrance, which is now nearly complete, will admit that the aim has been realized. The building is a reproduction of one of the old Dominican Mission Chapels of Southern California. In appearance it is decidedly interesting, and so faithful has been the work of reproduction that romance seems to cling to the rough stone walls. The architect departed from the original only to interject enough of the more ornate Moorish style to relieve the somber effect. The building is a clear story with a great flat dome as a crowning feature, and the semi-tropical appearance will be heightened by roof gardens. The measurements of the structure are 500 x 110 feet, and the elevation of the dome is 80 feet. In this building Schmid's colossal figure, typical of California, will be a feature. It was recently exhibited in San Francisco, where it created much favorable comment.

While exhibits will be made in every department, California expects to make particularly fine displays in the departments of mines and mining, agricultural and horticultural. In the first will be demonstrated its mineral resources, and many relics of the days of '49 will be shown. In the department of agriculture will be shown fruit and cereals, and in the horticultural hall will be the wine exhibit.

The ladies of California have taken an active interest in the fair, and have secured the right to decorate and furnish one of the reception rooms in the Woman's Building. This will be known as the "California Room" and will be one of the most attractive departments in the entire building. The redwood lumber dealers furnished the wood for the panels, and

\$2,000 was raised to pay an expert for the carving and graining. The cactus was taken as the motive of the decoration, and will be shown in every feature of the room.

Myriads of Banners.

On the entire grounds of the Paris exposition there were not one-third as many flag poles as will be in use at Jackson Park this summer. In the construction of the various World's Fair buildings and in the disposition of liberty poles about the grounds, the management has afforded the widest scope for utilizing flag decoration. Since last November flag designers and makers have been at work under the general supervision of F. D. Millet, director of decorations. It is probably within the truth to say that the result by May 1 will constitute an epoch in the use of bunting. Scores of busy fingers and dozens of machines are working every day in the southwest corner of Horticultural Hall, turning out the creations of able designers in the form of flags, banners and skylight draperies. These are carefully stored away until the auspicious day arrives, when the completed buildings will burst into a kaleidoscope of color, with banners fluttering from every pole and minaret on the spacious grounds.

The national flag will predominate. But, as it is to be a cosmopolitan fair, there will be also a prodigal use of the flags of all nations. Mr. Millet and his assistants have compiled a complete code of all the nationalities that boast a national emblem. They number 46, or, with the United States, 47. Most of these nationalities are exhibitors at the Fair, but some are only nominally represented as compared with others.

But the flags will be only a small portion of the bunting decorations. Probably four-fifths of the poles on the various buildings are for banners. Here is where the inexhaustible resources of the designers come into play. Not alone are these hundreds of banners to be a symphony in color as they wave in the sunlight; they are to be something more than a creation in harmonious light and shade. They will tell an allegorical story of the progress of the world which the exposition commemorates. On each building the banners will be an artistic index of the character of the exhibits inside.

For instance, on the agricultural building every pole will bear a different design. Plows, harrows and scores of implements, ancient and modern, will be represented. On Horticultural Hall there will be floral designs on the banners. There will be roses and lilies that will apparently stand without support, rising and falling with the alternate swell and subsidence of the summer breeze. On the great Manufactures Building the number of separate designs and their beauty can only be hinted at. On the Mines Building the banners will represent in an artistic way everything produced from a mine and the way it is produced. On the Transportation Building the banners will show the progress of transportation methods, from the earliest to the latest. On the banners of Machinery Hall there will be very few of the great developments in machinery not represented.

For the interior of the buildings there will be an enormous quantity of bunting used in the form of skylight draperies. Every building on the grounds is so well lighted that these draperies are necessary to soften and subdue the tones. Here again comes into play the general scheme of harmony of color and artistic effects. For instance, in the Manufactures Building the prevailing tints in the skylight draperies will be cream and corn; in the Agricultural Building, dark green and Nile green; Mines and Mining Building, shrimp and cream; Electricity Building, light blue and cream;

Transportation Building, Nile green and cream, and so on. In the Horticultural Building there will be so much natural coloring from plants and flowers that cream alone will be used in the draperies.

The amount of bunting necessary to make these draperies can be judged from the following figures: Manufactures Building, 148,000 square yards (1780 square yards in one skylight alone); Agricultural Building, 63,000 square yards; Mines and Mining Building, 70,000 square yards; Transportation Building, 64,000 square yards; Electricity Building, 81,000 square yards; Machinery Hall, 93,000 square yards (including annex); Horticultural Hall (including dome), about 74,000 square yards. Besides the skylight draperies, there will be an opportunity in several of the buildings for festooning with bunting between the arches. This will take a liberal supply, and the same harmonies in color will prevail.

Unique Railroad Exhibit.

Full-sized models of the first and oldest ten railroad locomotives in the world will be shown in a special exhibit to be made by the Baltimore & Ohio railroad in the Transportation Building. J. B. Pangborn, who has charge of the display, has already begun to make arrangements for its installation, and when completed it will be one of the most unique and instructive collections at the park. From the first locomotive that was built the evolution up to the present time will be shown and 34,000 square feet of space will be occupied.

Models of three of the old George Stephenson engines will be shown—the famous Rocket (1829), the Blanche (1816), and Mercury (1830). Full sized duplicates from the working drawings of Puffing Billy (1813), the first locomotive with smooth wheels for smooth rails, and the Sans Pareil, in which the steam blast was first introduced. From drawings in the Paris Conservatoire full-size reproductions have been made of the Cugnot (1769), the oldest locomotive in existence, and the Segrim (1827), the first locomotive in the world with multi-tubular boiler. Experts in Europe who have seen these reproductions pronounce them marvelous achievements and say it is hardly credible that iron, brass and copper could have been so successfully counterfeited.

The exhibit begins with the first method of steam propulsion on land—that of Sir Isaac Newton in 1680. Thence the continuous evolution is indicated to Trevithick and his initial design of the father of the locomotive (1800), and the first (1803) that ever ran on rail.

In 1830 the Cooper was tried on the Baltimore & Ohio Railroad. This was the first locomotive built in America, the first to draw a car, and the first to run more than a mile.

The Baltimore & Ohio have many venerable and valued relics of primitive construction. Four of their original grasshopper engines are still in the company's shops. These will be shown exactly as they appeared when first set to work. The Perkins ten-wheeler (1863), the earliest type of the powerful freight locomotive built for heavy grades, and the "600," the first Mogul ever constructed, and which was exhibited at the Centennial, will be shown full size and in motion. An exceptionally interesting feature will be the Peppersauce (1865), the first mountain climber and the first that ascended Mount Washington. All the old-time examples of locomotives will be mounted on the rails and roadbed of their respective periods.

Will Put 15,000 Men at Work.

Cold weather has a marked effect on the army of employees at Jackson Park. Fully half the force of laborers was retired. Only 5300 men are now at work in the

park, but some time before the gates open, perhaps as soon as the ice goes out of the lagoons and the snow runs off the roofs, more than 15,000 men will be at work. The laborers have been concentrated inside the buildings during the cold weather. All the men employed in road making, landscape gardening and other out of door work will be called back to put the grounds in condition for opening day.

Thirty-five State buildings are almost done. The joint territorial clubhouse built by Arizona, New Mexico and Oklahoma is just getting under way.

Chief Skiff's tunnel, under the Mines Building, to show the interior workings of a mine and give practical illustrations of removing ore, is almost finished. Mr. Burnham's men say Machinery Hall, which it was thought would not be ready in time for the opening, will be completed by March 15.

New York Reception Committee.

Director-General Davis has named seven prominent citizens of New York City to act as a committee to receive distinguished foreign guests *en route* to the exposition. He selected Charles S. Smith, Henry W. Cannon, Cornelius N. Bliss, A. E. Orr, F. Lynde Stetson, Charles R. Flint and J. Edward Simmons, and all of them have accepted the appointment and expressed their willingness to serve as members of the committee.

Charles Stuart Smith is president of the Chamber of Commerce and a director of several banks. He is a member of the Union League, Century and Players' clubs.

Henry W. Cannon is president of the Chase National Bank and was a delegate to the recent international monetary conference at Brussels.

Cornelius N. Bliss is first vice-president of the Fourth National Bank and the head of the dry goods house of Bliss, Fabyan & Co.

Alexander E. Orr is a grain merchant, a director of four railroads, including Rock Island and Union Pacific, is interested in several national banks and trust companies, and is vice-president of the Chamber of Commerce. He is also manager of the David Dows estate.

Francis Lynde Stetson is a leading lawyer of New York and a partner of President-elect Cleveland.

Charles R. Flint is a merchant and lawyer, who was formerly in partnership with ex-Mayor Grace. He is largely interested in the South American trade.

J. Edward Simmons is one of the leading financiers of New York and president of the Fourth National Bank.

Documents Proving the Danish Discovery.

Under certain rigid conditions the Danish Government has consented to lend to the exposition documents purporting to prove that America was discovered long before the man in whose honor the fair is being held landed on Watling's Island. These documents might appear out of place at the Columbian Exposition, but they are likely to be on exhibition. Clark E. Carr, Minister to Copenhagen, says that these Icelandic sagas are known as the "Codex Fluteyensis." He adds that notwithstanding the serious doubts that have arisen in Copenhagen as to the propriety of sending the manuscripts, the Government will send them on certain conditions. One of the terms is that the volumes shall be brought back at the close of the fair in a ship of war belonging to the United States Navy, and that every precaution shall be taken during the exposition to protect them from damage. It is stipulated, in a letter to Secretary of State Foster, that the volumes must be kept in an isolated place, where they will be free from danger from fire, and that in the

event of their loss the United States shall indemnify Denmark to the amount of at least \$20,000.

These documents are regarded by the Danish Government as furnishing conclusive proof that Columbus was not the first European to reach the shores of the new world. The papers have never been exhibited at great expositions, but as a special compliment to the United States they will be sent on the conditions named. The Government of Denmark is willing to intrust them to Commissioner Mier, who will organize a strong guard to accompany the papers.

Miscellaneous.

The long delayed steamship "Gardopee," bringing the first consignment of the Krupp gun exhibit for the World's Fair, arrived in Chesapeake Bay on the 22d ult. The vessel was 29 days coming from Hamburg. A train of 21 cars, specially constructed for the great weight they are to carry, were at the Maryland Steel Works at Sparrows' Point ready to take the guns to Chicago.

The block coal operators of the Brazil (Ind.) district met on the 27th ult. in response to a request from Commissioner Havens, of the World's Fair Commission, to take steps toward sending a coal and clay exhibit to the World's Fair at Chicago. It was unanimously agreed to send an exhibition and spare neither time nor money to make it a credit to the block coal district. It was agreed not to consider quantity but quality. The coal will be carefully selected and washed, when it will glisten like anthracite coal. The clay will be sent in the raw form. An architect has been employed to arrange the exhibit to the best advantage.

At a recent meeting of the Advisory Council of the World's Congress of Electricians to be held in Chicago this year it was decided that the meetings should last one week, beginning August 21. Fifty-five delegates from the leading countries of the world are expected to be in attendance.

The Inter-Continental Railway Commission have prepared a *fac-simile* in miniature of Central and South America to show the surveys of the proposed railroad intended to unite the systems of North and South America. The work was done by E. E. Court of the hydrographic office, and is a faithful representation of the topography of the countries named. It is about 25 feet long, and will be sent to the World's Fair as a part of the Government exhibit. In addition to the lines surveyed for the railroad the map also shows the routes of the present and prospective steamship lines from North to South America, with the names of their terminal ports and intermediate stopping points, if any.

Germany's \$150,000 World's Fair building at Jackson Park was dedicated last Friday. It was Emperor William's thirty-fourth birthday and Herr Wermuth determined to celebrate it in America. Herr Wermuth is the Emperor's World's Fair Commissioner. He gave all the German workmen a holiday and invited exposition officials to be present at the dedicatory exercises. Herr Wermuth did not speak of it in this way. He called it a "richt-fest," which translated into English is about equivalent to a "barn raising." The building is not yet completed, but the roof timbers are up and at that stage of a German building it is ready for the richt-fest.

Aside from financial perplexities Argentina is prosperous. Exports are once more upon a very large scale. The agricultural classes are doing well, and railway traffic is increasing. Trade is better, too, in Uruguay; Chili is recovering from the effects of the civil war, and the Brazilian Government is adopting a wiser policy.

American Turbine Water Wheels.—II.

BY SAMUEL WEBBER, CHARLESTOWN, N. H.

In my previous letter on this subject I considered the two principal forms of turbine imported into this country from the mountainous districts of France, and will now turn to the records of American inventions and changes. Long before the name of turbine was known here, American mechanics were at work on the old "tub wheel," or wheel on a vertical shaft, and in 1804 a patent was signed by Thos. Jefferson to Benjamin Tyler, the grandfather of John Tyler, the well known builder of turbines of to-day, for "an improvement in water wheels," making what he called

to cut off the water with a sharp edge, but to close the passage gradually while still preserving its tubular form. Thus it retained an unbroken and even flow of water and raised the net effect of "half-water" from 30 per cent. to 60 per cent. of its gross value.

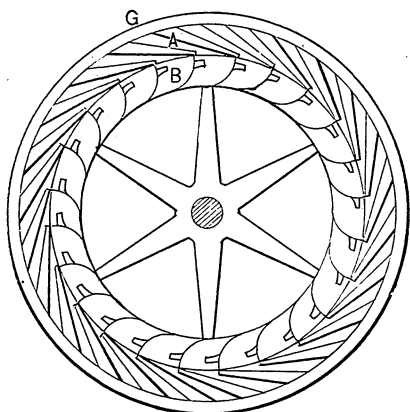
A tracing of this wheel, known as the "Howd" wheel or "United States wheel," is given, Fig. 4, taken from Mr. Francis' "Hydraulic Experiments." Mr. Francis took up the idea and experimented on it, as is shown in the above volume, and in 1849 built for the Booth Cotton Mills at Lowell a large wheel of this character, which gave results nearly equal to the Boyden-Fourneyron. A sketch of a section of this wheel is annexed, Figs. 5 and 6. It lasted until 1875, when it was

eral large wheels of this class came to pieces in the pits where in use.

Many cheap copies of Mr. Borden's wheel were also made in this way, by placing swaged buckets in the mold and casting the body of the wheel on to them, but the results obtained from such wheels have not shown a high degree of efficiency.

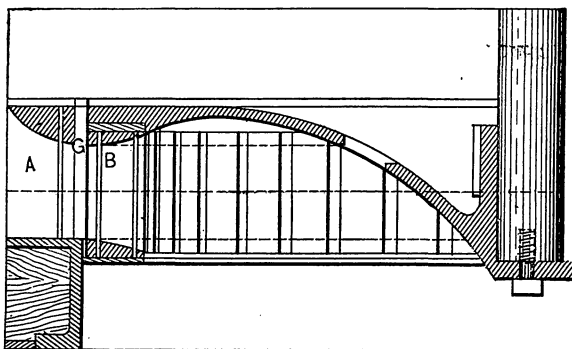
In the illustration, Fig. 7, of the Swain the feeder pipe is expanded into a large bulb, which gives space for water passage around the wheel, which it enters through the guides P P.

The gate O is cylindrical, having a broad flange flaring outward from its upper edge. In the flange are set the guides P, Fig. 8, which slide up into sockets in the upper garniture G when the gate is closed. When open the flaring lip of the gate, with the corresponding one of the garniture, form a taper passage, through which the water is delivered to the buckets W W. The buckets are cast into the crown and rim *a* and *b*, and the crown is bolted to the central core C. The step L, a block of wood boiled in oil, is placed inside the core C in the center of gravity of the wheel. The shaft M passes up through the feeder, being inclosed in an iron tube I I, and the gate rods which lift the gate are shown at R and R. The whole is supported on the base K, which throws the descending water outward. Fig. 8 is a horizontal section through the guides and buckets, and Fig. 9 a vertical section



G, Gate; A, Guides; B, Buckets.

Fig. 4.—The Howd or United States Wheel.



A, Guides; G, Gate; B, Buckets.

Fig. 5.—Vertical Section through Guides and Buckets.

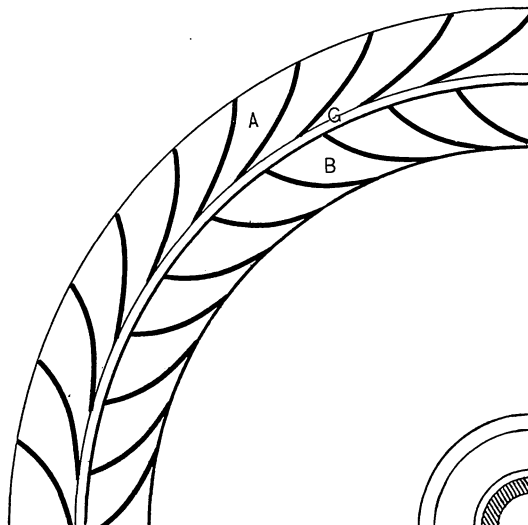


Fig. 6.—One-fourth Sectional Plan.

Figs. 5 and 6.—The Francis Central-Vent Wheel.

AMERICAN TURBINE WATER WHEELS.

the "wry-fly" wheel, in which he claimed "hooping the wheel with iron hoops," and specified the proper angles at which to set the buckets, "made of winding timber."

In 1838 a patent was granted to Samuel B. Howd of Geneva, N. Y.,* for a wheel which has proved the basis of all the American turbines in use to-day, in which he reversed the position of the guides and buckets from that of the Fourneyron wheel, placing the guides outside of the buckets (which were of cast iron, fastened by bolts to wooden top and base) and discharging the water toward the center, forming what is known as the "inward flow" wheel. The gate which admitted or cut off the water was placed outside the guides, where it was easily accessible and where it has been so constructed in various forms by different builders as not

replaced by a Swain wheel. A number of wheels of different names have been built by various makers, following on the lines of the Howd wheel or "inward" discharge, but the next great step, and the one which distinctly constitutes the characteristic feature of the modern American turbine, is the "inward and downward discharge" wheel, which, the writer thinks, was first introduced by A. M. Swain, then of Lowell, about 1855. The illustrations, Figs. 7 to 9, show the features of the Swain, in which, as in the Boyden, the buckets were formed of sheet metal, either iron or bronze, swaged to the proper curve, then placed in the mold at the foundry and the crown, cone and rim of the wheel cast on to them. With Norway iron buckets this answered very well, but with the bronze ones it proved a failure, as the bronze was so softened and weakened by the heat of the iron that sev-

through the wheel, showing the long and approximately cycloidal curve of the buckets.

Now, it will be seen on examination of the buckets that they only extend inward to the double line shown, Fig. 9, the heavy line being only a section through the metal of the bucket. This left a large space between the inner edge of the bucket and the core C, which has since been filled up by later improvements, as we shall show in due place, so that in the later wheels the core is made larger and the buckets brought clear down to the base line of the wheel, so that the discharge in these wheels is entirely downward, and even in some of them "outward," while the water enters them all in an inward direction. The first tests of this wheel, by Hiram F. Mills, gave very satisfactory results and led to further improvements in the wheel, until the last test of a '72

*Mr. Francis says a similar wheel was proposed by Poncelet in 1826.

wheel by Jas. B. Francis in 1875, gave 83.4 per cent. at full gate, and 66 per cent. at one-third gate or one-half water. A large number of these wheels have been put into the mills of New England, in many cases to take the place of Boyden wheels, which had become worn and corroded by 30 or 40 years' exposure to the water, but in turn are now being supplanted to a considerable extent by some of the later patterns, cast in one piece,

tube—just sufficient to reach "tail-water" below. These wheels, though less expensive in construction than the Boyden-Fourneyron, were still too costly for ordinary country use in saw mills and grist mills, and were mainly built in large sizes for the great cotton and woolen mills of New England.

The advantages of the turbine form of wheel, especially under high heads, had, however, led to the construction of cast-

establishment of a freight bureau, to prevent unfair discrimination, but the comparatively small attendance at a meeting held last week indicates a lack of interest in the subject.

Micanite.

Eugene Munsell & Co., 218 Water street, New York, sole agents for the Mica Insulator Company of Schenectady, N. Y., are

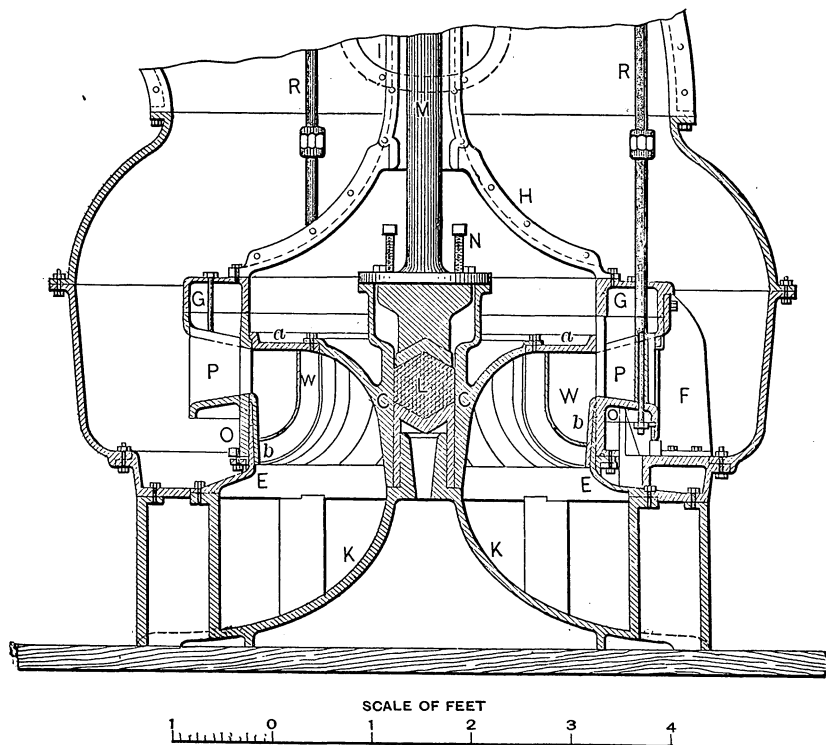


Fig. 7.—Vertical Section.

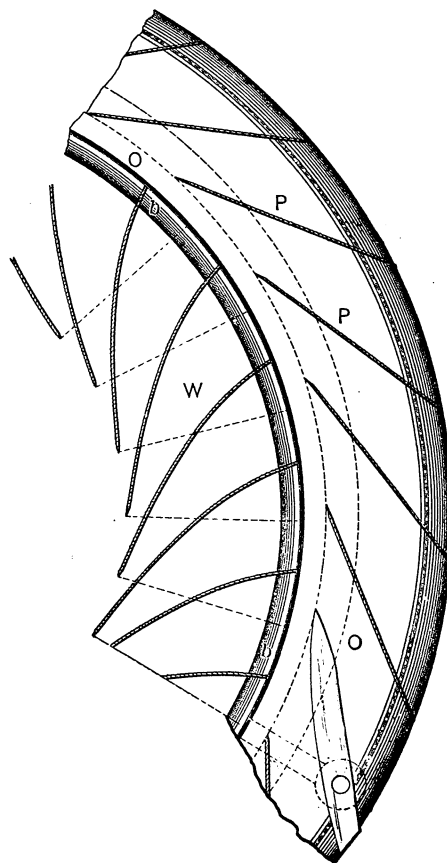


Fig. 8.—Part Sectional Plan.

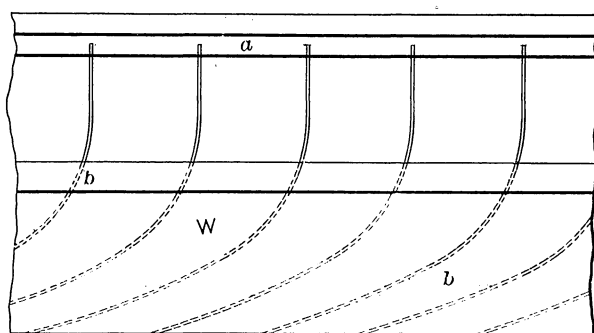


Fig. 9.—Diagram of Buckets.

Figs. 7 to 9.—The Swain Turbine.

AMERICAN TURBINE WATER WHEELS.

often of bronze, and in which the improvements give higher efficiency and equal power with a much smaller and less expensive wheel. Still, as I have said, I believe the Swain wheel to have been the forerunner and prototype of all the best American turbines of the present day, and to have contained all the essential principles involved in them.

Many of these wheels were also built without feeder pipe and case, and were set under low heads directly in the bottom of an open flume with a very short draft

iron wheels in one piece by a number of builders. It is difficult to now give the exact date of the origin of many of these wheels, some of which, no doubt, were invented or evolved from the old tub wheel directly, without reference to foreign models. The scroll wheel, so called, was among the early types, but to these wheels generally I shall devote another chapter.

Many of the principal manufacturers in Pittsburgh are formulating a plan for the

introducing, under the name Micanite, a new electrical insulating material. This is described as made of pure India sheet mica and the least possible amount of cement of the highest resistance. It can be furnished in any desired form or size. They inform us it has passed the experimental stage, been thoroughly tested and is now in actual use by large electrical manufacturers. While it is true mica has long been recognized as a valuable insulator, the difficulty for many uses has been its great cost, no suitable substitute having yet been found to take its place. Now, however, they have succeeded in utilizing what heretofore has been a waste product. In cutting plates for various uses there has always been considerable refuse. The mica scrap is just as valuable for insulation, the difficulty having been to properly prepare it. This has now been accomplished and this material can be supplied in any form required. The compound readily lends itself to manipulation under mechanical processes, such as sawing, shearing, punching and boring. This production was recently described at length in a paper read before the American Institute of Electrical Engineers by Edward P. Thompson, the title of the paper being "Micanite and Its Application to Armature Insulation."

Freight rates on Long Island Sound are liable to undergo radical changes, now that the New York & New England road has withdrawn from the association.

Electricity in a Small Arms Factory.

A particularly interesting installment of electric motors in a shop is described by L. Castermans and F. Melotte in a paper contributed to the *Revue Universelle des Mines*. In 1886 several of the gun-making firms in Liège formed a syndicate for the erection of a small-arms factory upon the most improved principles; and upon receiving an order for 150,000 to 200,000 Mauser rifles, 6.75 mm. caliber, from the Belgian Government, a company called the National Military Arms Factory was organized for carrying out the scheme. The factory, designed by Mr. Castermans, is placed entirely on the ground level, avoiding the use of upper floors, the larger portion of the machine tools being contained in a large hall about 345 feet long and 245 feet broad, placed at some distance from the forges and the engine and boiler houses, in order that their working may not be influenced by shocks or dust. The more dangerous shops in which wood working is carried on are also placed on the outside so as to be readily accessible in case of fire. The site selected, of about 20 acres, is at Herstal, which necessitates the use of pumping machinery to bring feed water from the lateral Meuse Canal, at a distance of about $\frac{1}{2}$ mile—an inconvenience which is, however, counterbalanced by having skilled workmen close at hand, the locality being in the center of the gun trade.

The area of the covered buildings is 22,000 sq. m. They were completed in six months.

The main shop is divided into 14 bays by lines of columns spaced $7\frac{1}{2}$ m. apart, each being of sufficient width to take four rows of machines with a passage between them. The roof lights are glazed with large sheets of plate glass, which dispenses with the ordinary heavy iron sashes, besides diminishing the chance of breakage. A proof house, with a sighting range of 200 m., adjoins the factory on one side.

The chief point of interest is, however, to be found in the arrangement of the driving power and transmissions. For the actual work of the machines, 13 lines of shafting, varying in their demands from 12 to 30 horse-power each, to a total of 200 horse-power, are required; but in order to maintain the necessary subdivision from a single motor by the ordinary method of driving with leather belts or manila ropes, about 70 tons of intermediate mechanism, 40 tons of shafting and pulleys and 30 tons of bearings would be necessary. As an alternative, a telodynamic cable for carrying a large portion of the power by a single change was suggested, but was considered objectionable, the large driving pulleys, 14 feet in diameter, and the presence of a rope traveling at a very high speed through the shops, being likely to cause inconvenience.

It was ultimately decided, on the proposition of the Compagnie Internationale de l'Electricité, to drive each of the separate lines of shafting in the shops by an electro-motor receiving the current from a dynamo connected with the main engine, whose armature replaces the fly wheel of the latter. In this manner a current of 2440 ampères at 125 volts is produced by an armature of very large size, moving at the low speed of 66 revolutions per minute—a combination which has not hitherto been attempted, at any rate upon the same scale.

The power required being 200 horse-power, the motors supplied and their guaranteed efficiencies are:

H.-P.	H.-P.	Mo- tors.	H.-P.	H.-P.	Per cent. of effi- ciency.
9 of 12 = 108, require	9	of 16 = 144,	87		
2 of 16 = 32, require	2	of 21 = 42,	87		
2 of 30 = 60, require	2	of 37 = 74,	89		
200		260			

which requires $165.5 + 48.3 + 83.1 = 296.9$, or, allowing 2 per cent. for loss in the conductors, 303 horse power at the terminals of the dynamo. The efficiency of the latter being guaranteed at 90 per cent. of that of the engine, the available work demanded from the fly-wheel shaft is 333.6 horse-power, corresponding to a transmission of 77.2 per cent.

The horizontal compound condensing engine of 500 horse-power is made by M. Van den Kerkhove, who guaranteed the internal resistance not to exceed 8 per cent., or 40 horse-power, but it has been found to be something less than 6 per cent., allowing for which the final result comes out as 72.5 per cent. of the indicated horse-power available at the driving pulleys of the motor dynamos. The main dynamo is of the Gramme type of construction, that system of winding being called for by the large dimensions of the armature.

About 110 horse-power is taken off the main current for the electric lighting, which includes 116 arc lights of 10 ampères, arranged two by two in series, and 200 16 candle incandescent lights. The latter are supplied from a ring with 24 feeders, which are not covered except in the tunnel between the engine room and the distributing board. The drop in the current is 7 volts when the whole of the lamps are lighted.

The motors distributed through the works are all of the same kind, with a double magnetic circuit and Gramme armatures. The magnet cores are cylinders of wrought iron, placed upright, with cast-iron pole pieces, which are fitted to the framing and bored out at the same time as the shaft bearings in order to have the armature perfectly centered. The armature core is formed of disks of sheet iron carried upon a series of arms parallel to the shaft attached to a boss cast in bronze. The winding has only a single outer layer of wire. The ends of the commutator plates are contained in a hollow cone of cast iron, which is secured by a conical ring, the whole forming a perfectly compact mass which cannot be distorted even by the blow of a hammer. The brushes are made of a special kind of carbon, which gives no trouble even under considerable variations in load, so that the electrician in charge has only to attend to the starting and stopping, the greater part of his time being occupied with clearing and replacing the carbons of the arc lights, which, as before stated, are 116 in number, distributed over an area of about 11 acres.

The number and distribution of the motors in use is as follows:

Position.	HP	Number.	Guaranteed efficiency.
			Per cent.
Great hall.....	16	9	87
Wood-working shop.	21	1	87
Forges.....	37	2	89
Breech-action shop.	16	1	87
Polishing shop.....	16	1	84
Pumps.....	10	1	85
Ventilator.....	3	1	80
Cartridge shop.....	21	1	..

The average efficiency of the motors is 87 per cent., which, multiplied by 98 per cent. for that of the conductors and 90 per cent. for the principal dynamo, gives 76.6 per cent. as the efficiency of the transmission—that is, the relation between the steam power and that delivered to the shop shafts. The total weight of copper in the distributing circuit is 5.4 tons.

In the electrical transmission the resistances producing losses are made up of those of the magnetic core, which are substantially constant, and those of the armature wire and the armature bearings and conductors which, according to Joule's law, are proportional to the resistance of the conductors and to the square

of the intensity of the current; while in the former the losses in transmission are constant whatever may be the proportion of power utilized, so that this method becomes very disadvantageous when the power is not fully employed. This is shown in the following table, where the losses are supposed to be the same on both systems under full load, which is putting it rather too favorably for the mechanical system.

Electric Transmission.

	1,000	750	500	333	250	200
Power charged	1,000	750	500	333	250	200
Fixed loss.....	50	50	50	50	50	50
Variable losses	50	27	11	4.5	2.2	1.2
Disposable energy of dynamo.....	900	673	439	278.5	197.8	148.8
Efficiency, per cent.....	90	89.7	87.8	83.5	79.1	74.4
Loss in conductors, variable.....	18	10	4	1.7	0.8	0.5
Disposable at motor.....	882	663	435	276.8	197	148.3
Fixed losses, 6 per cent.....	53	53	53	53	53	53.0
Variable losses, 4 per cent.....	35	20	8.5	3.4	1.7	1.0
Disposable energy.....	794	590	373.5	220.4	142.3	94.5
Final efficiency, per cent.....	79.4	78.7	74.7	66.2	57.0	47.2

Mechanical Transmission.

	1,000	750	500	333	250	200
Power charged	1,000	750	500	333	250	200
Fixed losses.....	206	206	206	206	206	206
Useful work.....	794	544	294	127	44	...
Final efficiency, per cent.....	79.4	72.5	58.8	38.1	17.6	...

From which it appears that with the motor at half power and below the loss in transmission is very much larger by mechanical than by electrical means.

A series of determinations were made of the average power required by different groups of machines and the loss on the intermediate transmissions. This was done by interposing in the circuit of a motor driving a principal line of shafting a registering ampère meter, giving a curve of which the abscissæ are proportional to the time and the ordinates to the intensity of the current. As the latter bears a certain ratio to the energy absorbed by the motor, it is easy to compute from the curve the work done at any particular moment when the voltage and proportional effect are known, and the measuring apparatus used in this way becomes a most perfect dynamometer. The method has been applied to determining, 1, the work absorbed by different machine tools; 2, the requirements of the different shops under ordinary working conditions, and 3, the coefficient of friction of the different lines of shafting. Several of the diagrams published in connection with the original paper show the demand on the engines to be extremely irregular and to vary very rapidly; but as a rule not more than 50 to 60 per cent. of the total power is required with the shop in full work. In the first bay of the great hall, containing the most exact tools employed on the production of cutters and drills, when very actively employed, the average power taken was 7.3 horse power during several hours observation, with a maximum of 11 horse power for a few moments when several heavy machines were put in gear simultaneously. During the remainder of the time the power varied from $8\frac{1}{2}$ to 6 horse-power and sometimes fell to 5 horse-power. When all the machines were thrown into gear with their cutting tools lifted the meter registered 11 horse power and the shafting alone running empty 4 horse-power, or 55 per cent. of the 7.3 horse-power required under normal working conditions.

In a similar experiment made at the Royal Arsenal at Liège, a group of machines required 6.2 horse-power when

doing no work, which was raised to 6.9 horse-power when the cutting tools were made to bite. When all the machines were thrown off 4.2 horse-power was registered, showing that 2 horse-power was required by the tools (shaping machines and lathes) when running light, and only 0.7 horse-power more when doing work. The proportion of the latter is 26 per cent. of the work supplied to the machines as 1.25 per cent. of that of the powerful shaft. The results indicate very clearly how small a fraction of the power supplied to machine shops is actually utilized and the profits to be looked for in improving methods of transmission.

The Harris-Corliss Engine.

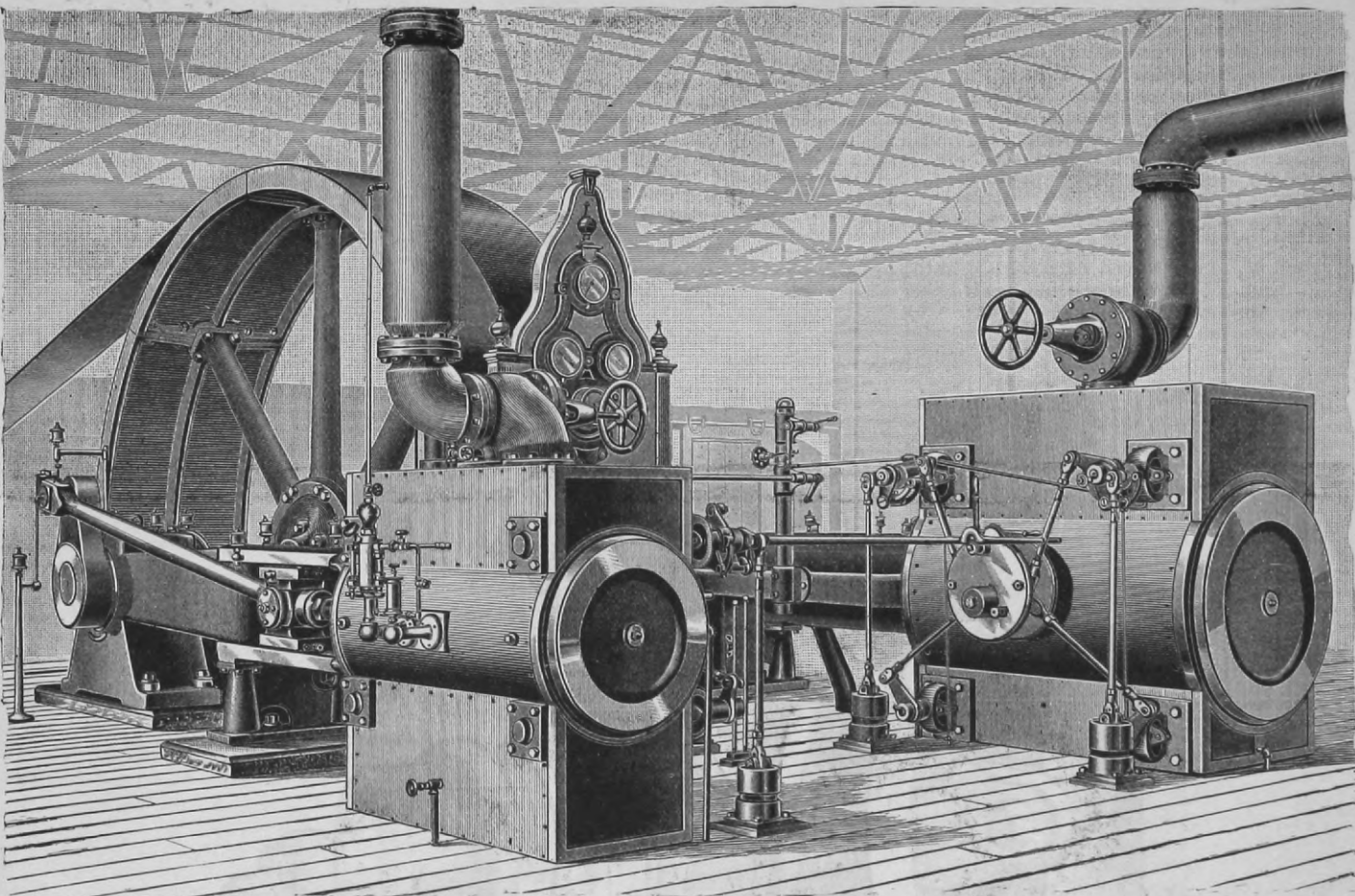
For many years the high grade, moderate speed steam engines of the Corliss type, built by the William A. Harris

remaining in line and in good running order under the severest conditions met. All the wearing surfaces have been enlarged and made ample in size for the heaviest work; new constructions have been adopted for many parts where greater security against accident or additional convenience of handling or repairing would be obtained, and all parts have been so proportioned as to make a harmonious and pleasing appearance. All molding and unnecessary ornamentation have been left off, the endeavor being to produce lines which are simple and direct.

In the following we shall briefly describe the cross compound engine shown in the perspective view and then mention the principal features. The Harris-Corliss cross compound engines are arranged similar to a pair of simple engines, each cylinder working on its own crank set at right angles to the other, and each having its own frame, cross-head, connecting rod,

risk of losing castings, with its contingent delay. This method also admits of making cylinders with or without jackets, as may be desired. The sectional cylinder, Fig. 2, when constructed with a jacket, is so arranged that the barrel of the cylinder is free to expand independently of the rest of the cylinder, a steam-tight joint being made between it and the jacket by means of an ordinary stuffing box packed with fibrous packing, the packing being cured by steam before the cylinder leaves the works. All risk of fracture by unequal expansion is thus avoided. This method of construction permits of contracting for large powers, with confidence that the cylinder will be perfectly satisfactory.

The smaller sizes of jacketed cylinders have the jackets cast on, expansion being taken care of by a central, circumferential depression in the jackets, which divides them in halves.



THE HARRIS-CORLISS CROSS COMPOUND ENGINE.

Steam Engine Company of Providence, R. I., have been familiar to users of large units of power. From the modest beginning made in 1864 by William A. Harris, the business has grown to its present large proportions, carried on in well equipped shops, provided with machinery specially designed for the work in hand. The company have made such changes in the several types of engines built by them as would bring them to a higher state of perfection.

The severe strains now imposed upon engines by high steam pressure, quicker speed of rotation and fluctuating load, which have grown out of their frequent employment in running electric roads and lighting plants, cable railways, rolling mills, &c., have led to an entire reconstruction of the pattern for frame, main pillow block and column of these engines, adding largely to the weight of each, and so disposing the metal as to increase the rigidity of the engine and its power of

&c. This construction enables one side to be run as a simple engine, in case of accident to the other, and the two cranks give a very uniform turning motion to the shaft. This form of engine may be installed one-half at a time in case the full power of the engine is not needed at once, the high pressure side being usually put in first, and the wheel being made large enough to drive the full power of both cylinders. The high pressure cylinder will, in this case, give about three-fifths of the power of the complete engine.

The use of cylinders of large diameter being necessary in this type of engine, and the ordinary method of construction in which the cylinder is cast in a single piece producing extremely complicated castings, a "sectional" construction has been adopted by this company which permits each individual piece to be made comparatively simple in construction, insures entire freedom from shrinkage strains and sponginess, and therefore minimizes the

The employment of a jacketed receiver is recommended whether the cylinders are jacketed or not, as it undoubtedly adds much to the efficiency of the engine, thoroughly drying the steam in its passage from one cylinder to the other. In the receivers used the receiver space is provided with internally projecting ribs which break up the current of the steam, thus bringing it thoroughly in contact with the walls heated by the outer jacket steam. The jacket surrounds the receiver along its entire length, the difference of expansion in receiver and jacket being taken care of by flexible steel plates which allow no leakage and at the same time permit sufficient motion of one shell past the other to avoid all undue strain.

These cylinders are cast from a mixture containing a large proportion of charcoal iron, which is made as hard as can be worked on the machine, thus securing excellent wearing qualities. Much attention has been paid to the obtaining of ample

port area and to reducing the clearance or waste space to its lowest limit.

The piston is of the well known Babbitt and Harris type, which has been in use for about 20 years. It remains tight, even after long wear, and the packing being set out by springs, has no tendency to wear the cylinder large at the ends.

In the releasing mechanism, Fig. 3, the use of springs is entirely dispensed with. The engagement of the hook is positive and takes place entirely through the action of gravity, and the release is effected by a positive locked edge cam which cannot fail to perform its duty. The parts are so designed that the action of the mechanism is noiseless. Provision has been made for adjustment in case of wear, and the locking surfaces have four edges each, which can be brought successively into contact when necessary. A hook is provided which closes the valve positively and with certainty in case of the failure of the dash pot to perform its work, either from the stuffing box being packed too tightly or from other cause.

The dash pot shown in Fig. 4 is of the well known "noiseless" form. It requires no piping to conduct the compressed air away, is placed on the engine floor where it is in plain view, and adapts itself readily to great variations of load in the engine, without adjustment. Owing to its form the working parts are protected from dust.

The regulator is of the Porter type, running at a speed of 225 revolutions per minute, with heavy balls and counterweight, which features give it great power and sensitiveness. It is provided with an efficient stop motion, actuated by a weight, the office of which is to cut off the supply of steam from the cylinder in case of slipping or breakage of the governor belt. When required there is also provided a de-

instantly stopped from any of the stations by simply pressing the push button.

do so, using one eccentric and wrist plate to actuate the steam valves, and the other

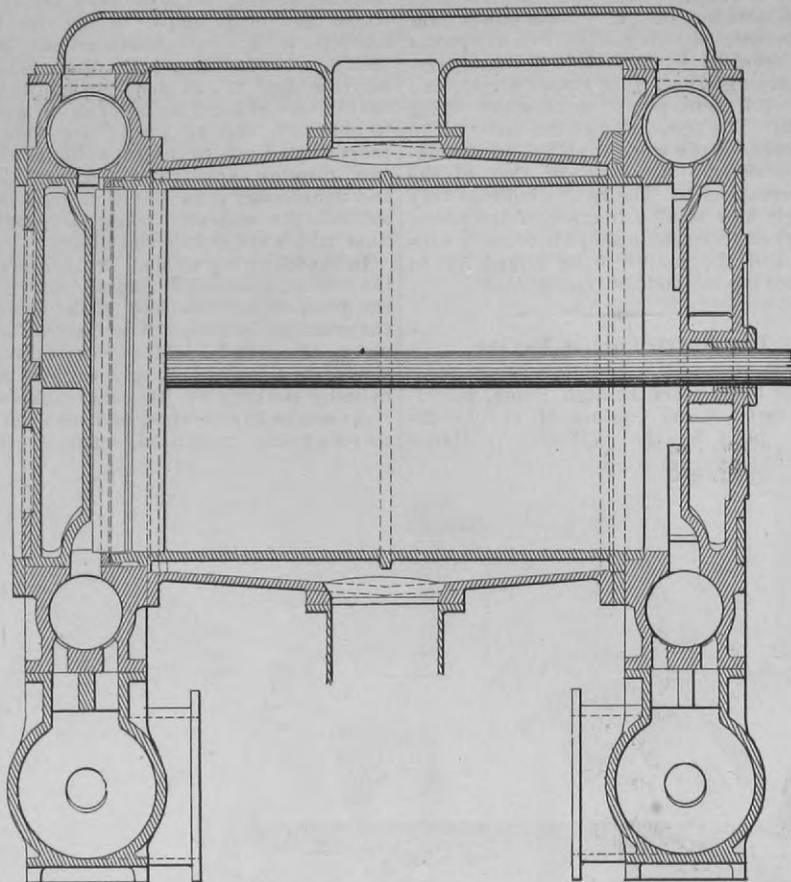


Fig. 2.—Jacketed Sectional Cylinder.

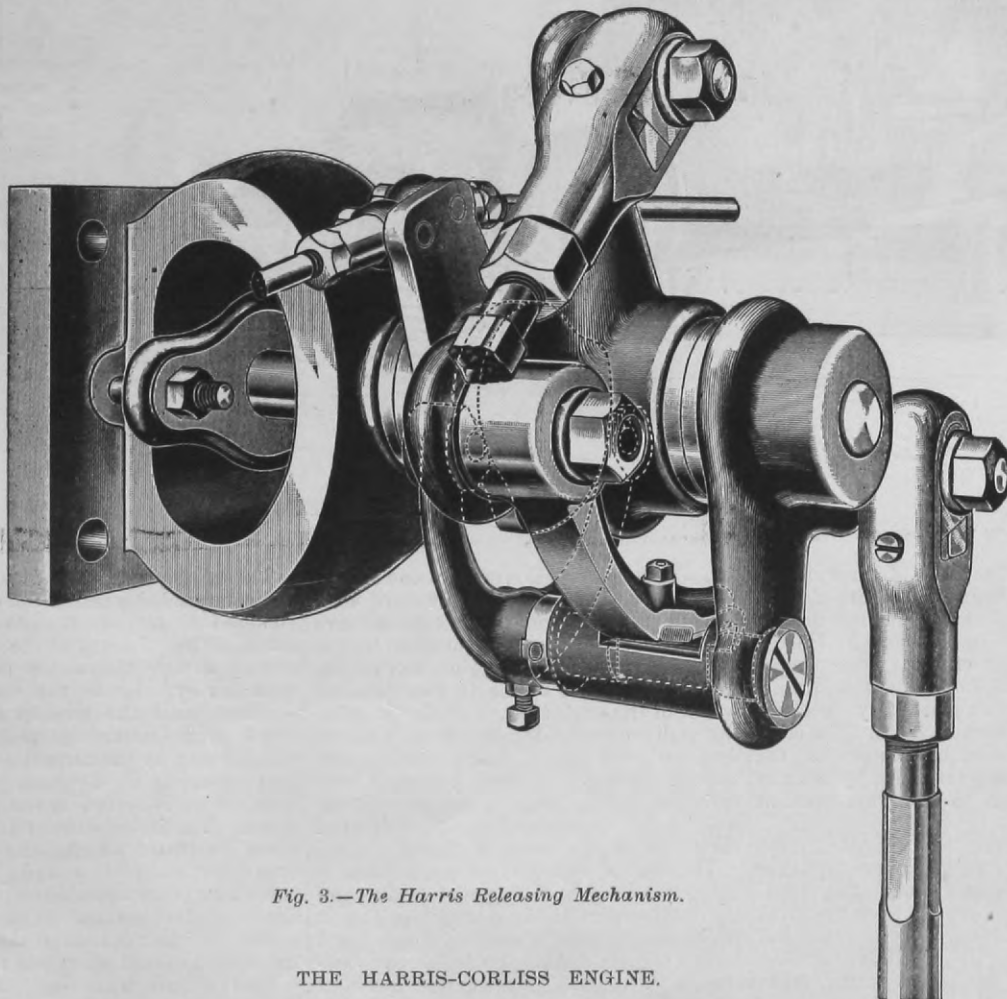


Fig. 3.—The Harris Releasing Mechanism.

THE HARRIS-CORLISS ENGINE.

vice which may be connected by means of wires, push buttons and a battery to any point in a mill, enabling the engine to be

A specialty is made of the application of two wrist plates and eccentrics, whenever the conditions make it desirable to

performing the same office for the exhaust valves.

The connecting rods are of two types,

according to the size of the engine. For all sizes up to 24 inches diameter the well-known solid end is used, with the boxes let into a recess cut from the solid rod. The adjustment of boxes is made by wedges which have a bearing the full width of the box and three-fourths of the height, and set up by adjusting bolts. For sizes from and including 24 inches and upward the same arrangement is used for the crank-pin end, modified by the use of a reamed steel bolt to retain the boxes in place. This plan greatly increases the facility with which the rod can be disconnected in the larger sizes, without losing any of the good points of the regular solid rod. This feature enables the adjustment of the exhaust valves to secure the prompt

of concealed wedges, operated by longitudinally placed adjusting bolts. The wrist pin is easily removed for disconnecting the connecting rod and may be revolved in the cross head to correct any tendency to wear oval.

The fly wheels are cast whole, up to and including wheels 9 feet in diameter. From 10 feet to 17 feet in diameter the wheels are cast in halves, the joints being planed, and the halves united by turned bolts, accurately fitting their holes.

Wheels 16 feet and upward in diameter are constructed in segments, having 8, 10 or 12 segments in each wheel, and the same number of arms. The arms are of the oval hollow construction, this being the form which gives maximum strength,

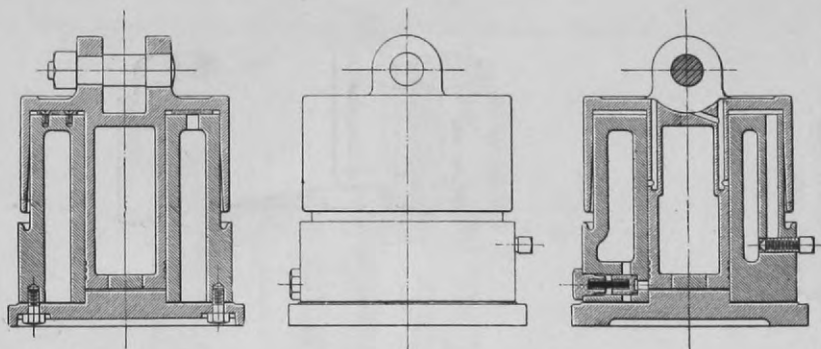


Fig. 4.—The Dash Pot.

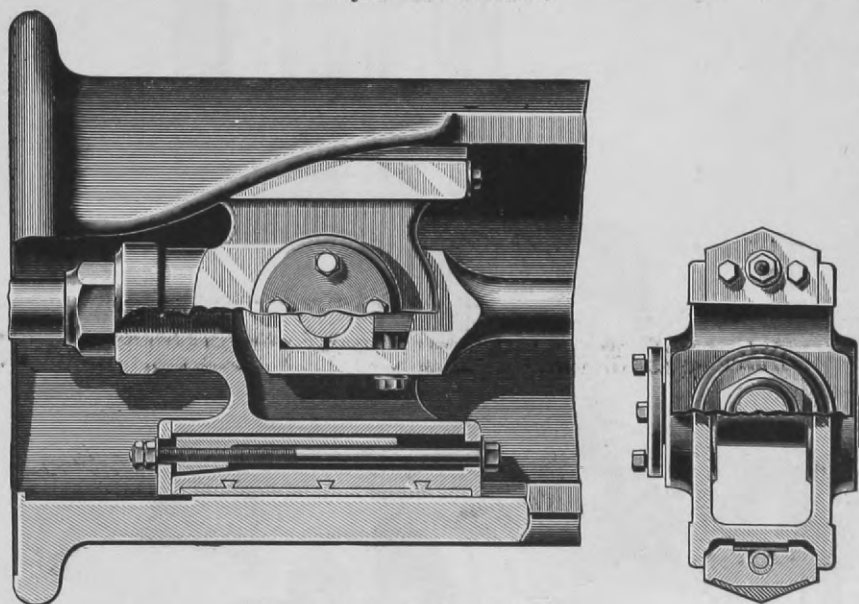


Fig. 5.—The Cross Head.

THE HARRIS-CORLISS ENGINE.

release of the steam at the end of the expansion, thus securing a free exhaust and absence of back pressure, and also permits compressing the steam at the end of the return stroke sufficiently to fill the clearance spaces and warm the cylinder walls up to a temperature approaching that of the entering steam; all of which results in increased economy of the engine. The steam valves can be so moved with this arrangement as to secure the extreme range of automatic cut off which the trip motion can afford, and in cases where the great variation of the load renders it desirable, the mechanism can be so arranged that cut-off can take place at any point from 0 to seven-tenths stroke, keeping the engine entirely under control of the regulator, and giving great range of power, with the utmost regularity of speed.

The cross head, Fig. 5, is of the box pattern, has large bearing surfaces always central with the wrist pin, the adjustment for wear being made by means

with a minimum amount of useless metal, and the exterior shape of the arm is such as to offer the least resistance to passage through the air. All flanges are accurately planed to a fit. The arms are securely bolted to the rim segments, and are held at the shaft between the flanges of the hub, the entire bolting of the wheel being by means of turned bolts, accurately fitting their holes. Ample strength is given the bolts to resist the greatest possible strain which may come upon them.

The main bearings are lined with babbitt metal; also the cross-head gibs and crank-pin boxes. The cross-head boxes are phosphor bronze; all other journals have boxes of hard bronze. The shafts are made of best quality of hammered wrought iron; crank and cross-head pins, piston and connecting rods of open-hearth forged steel.

All working parts subject to wear are provided with adjustments which enable the wear to be compensated for.

Electrical Furnaces for Experimental Research.

Electrical furnaces of several patterns have been devised for employment in experimental research, the object in view in designing them being to apply to purposes of laboratory work the intense heat of the voltaic arc obtained by passing a powerful current of electricity between carbon points. Their construction is generally such that the heat is developed in a space in the interior of a mass of some refractory substance, and they are usually so arranged that when any small body is introduced into the inclosed cavity the phenomena resulting from the operation of the furnace can be observed.

According to a description published recently a late form of the Siemens electrical furnace for laboratory use is about 6 inches in height and nearly cubical in form, and has sheets of mica so fitted as to afford a view of the interior.

By the use of electrical furnaces in laboratory work not only are extremely high temperatures attainable, but the heat generated can be applied under conditions favorable to the successful prosecution of elaborate investigations. The action of different metals and other chemical elements when subjected to great heat, either separately or while in contact with various substances, can be thus studied advantageously. New experiments become practicable also in obtaining metals in pure form, in the crystallization of minerals and in connection with other subjects of inquiry.

Investigators in the field of research opened to exploration by this means have reported a number of interesting developments, and while these have heretofore been mainly of scientific interest, yet they begin already to show results that may be expected to have an important bearing on industrial processes.

An eminent French scientist, Henri Moissan, has recently submitted to the Académie des Sciences some results obtained with a new type of electrical furnace, in which he claims that he has been able to develop and to utilize temperatures of 2000°, 2500° and even as high as 3000° C., or approximately 3600° to 5400° F. The refractory material used in this furnace is quicklime (calcium monoxide), a substance of which the infusibility is so marked that it serves for making crucibles in which to melt metals having a very high point of fusion, a blow pipe being, of course, employed in doing such work by the methods ordinarily used hitherto.

For comparison with the temperatures mentioned it may be noted that while Bunsen's experiments showed the maximum temperature of the oxyhydrogen flame to be 2870° C., it is not ordinarily practicable to obtain by this means a heating effect higher than about 2000°. Experiments with explosive gaseous mixtures are, however, reported to have given temperatures momentarily of 4000° to 4500° C.

Experiments were made by M. Moissan in the crystallization of metals and various substances. Some of his tests resulted in the crystallization of rubies and other rare stones, though probably not of such size and character as to have a commercial value. Uranium in a pure state was obtained also, a quantity of about 5 ounces being yielded at one time—in the case of this metal a notable achievement.

The highest temperature reached in the course of these investigations was 3500° C. At this point the lime forming the interior of the furnace showed active liquefaction, thus enlarging the interior space rapidly, the surrounding bricks of lime becoming welded together meanwhile, until finally the experiment

was brought to an end by the sudden destruction of the furnace.

Great caution is essential in conducting experiments such as those of M. Moissan. It is necessary to protect the person, and particularly the face and eyes, with much care against the heat and light of the electric arc when employed in the way described. A striking instance of the possible effects of exposure to heat generated by the electric arc, even as used in practical work, was afforded by an incident which occurred in Russia a few months ago, at the Kolomna Iron Works, near Moscow.

At the time referred to some men were engaged in the operation of electric welding by means of the Bernardos or arc

"electric sunstroke" has been applied, is probably of a similar nature.

In conclusion, it may be remarked that the close relation existing to-day between scientific investigation and the introduction of new methods in practical operations is illustrated by the constantly increasing number of industrial applications of electricity which show promise of important results.

The Waterbury Farrel Hydraulic Presses.

We present engravings of two powerful hydraulic presses and a three-plunger power pump, built by the Waterbury

the space between them is 35 inches, and the distance from the top of the ram, when down, to the upper platen is 60 inches. The cylinder is calculated to withstand a pressure of 8000 pounds per square inch with safety. The total weight of the machine without pump is 75,000 pounds.

Fig. 3 represents a high-duty power pump designed for operating hydraulic presses, &c., under extremely heavy pressure. The main shaft is $3\frac{1}{2}$ inches in diameter at its journals, and is provided with adjustments for taking up wear in all directions. The connecting rods are made of steel, with bronze boxes provided with all adjustments, and hardened steel pins connecting with the cross heads. The plungers are of steel, hardened and ground,

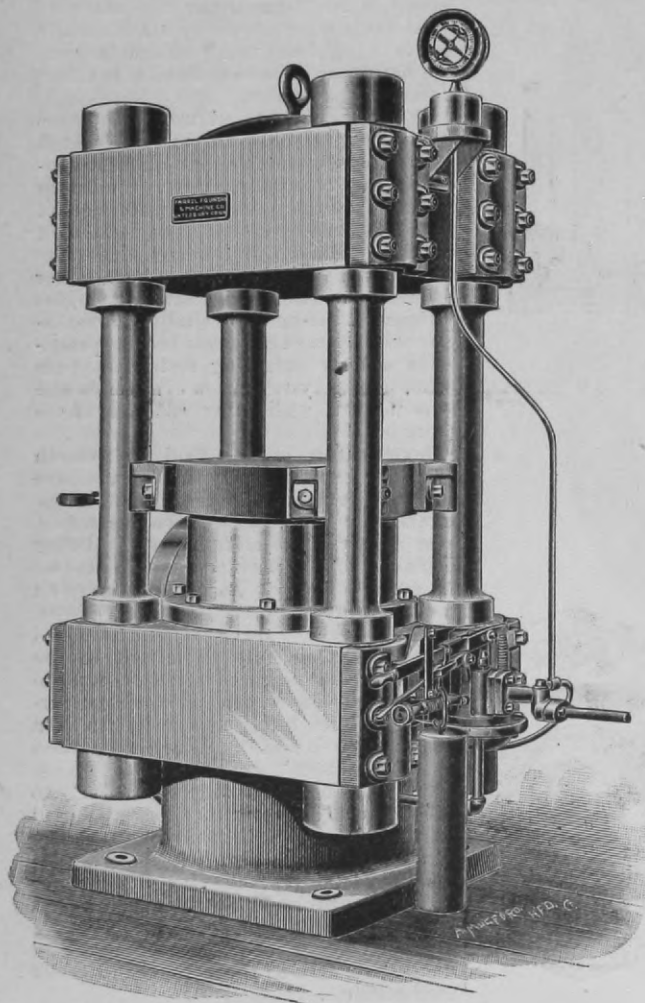


Fig. 1.—750-Ton Hydraulic Press.

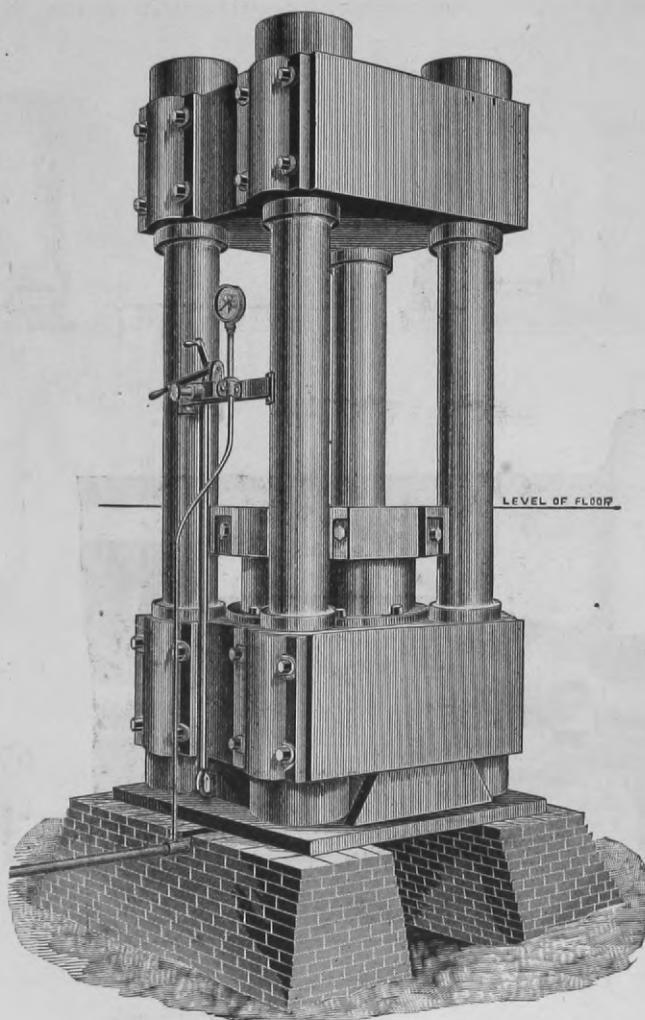


Fig. 2.—3000-Ton Hydraulic Press.

THE WATERBURY FARREL HYDRAULIC PRESSES.

process, their eyes being covered by tinted glasses. Great irritation of the skin and eyes was felt by the men engaged in the work on this occasion, and this was followed a few hours later by discharges from the nose and eyes, succeeded by a dry cough. After a further interval of some hours other symptoms manifested themselves, as a swelling of the skin, a marked burning sensation of the eyes continuing for several hours, and finally a coloring of the skin. A peeling of the cuticle then took place, this lasting through about two days. In six days no further pain was felt, but the colored appearance of the skin continued for several weeks.

A physical effect which the workmen have experienced in connection with electric welding by the arc process at the very extensive iron and steel works at Le Creusot, in France, and to which the name

Farrel Foundry & Machine Company of Waterbury, Conn. Each of these presses is fitted with an automatic valve, the motion of which is arranged to trip automatically as soon as the desired pressure is reached, and which can be regulated instantly to any pressure within the limits of the capacity of the machine. Each press has copper-lined steel cylinders, that of the small being 18 inches in diameter and of the other 32 inches in diameter. The rods of the first press are $5\frac{1}{2}$ inches in diameter at the smallest part, the space between them is 24 inches and the distance between the platens when separated is 19 inches. The distance from the face of the ram to the floor is 45 inches, and the total height 7 feet. The lower part of the base forms the tank for water. The vertical rods of the 3000 ton press are $11\frac{1}{2}$ inches in diameter at the smallest part,

and pump barrels and valves of the best phosphor bronze are carefully fitted and provided with lubricating devices and adjustments. The stroke of the plungers is 5 inches; diameter of plungers, 1 inch. The driving pulleys are 54 inches diameter and $7\frac{1}{2}$ inches face. Distance from center to center of pulleys, 39 inches; floor space required, 4 x 5 feet; height from bottom of base to center of main shaft, $42\frac{1}{2}$ inches. The pump is capable of working under a pressure of 8000 pounds per square inch, and is run 60 revolutions per minute. Its total weight is 2800 pounds.

New plans have been made for the projected bridge across the English Channel, and the promoters will apply to Parliament this session for power to go ahead with its construction. The engineers are

Sir John Fowler and Sir Benjamin Baker. The length of the bridge has been reduced about three miles and the number of piers have been reduced from 121 to 72. The cantilever system is proposed. The greatest span will be 1640 feet. The masonry piers are to be 147 feet long and 66 feet broad. The cost is estimated at £32,750,000.

Vacuum in Condensing Engines and Feed-Water Heaters.

A point in steam engineering that, while entirely familiar to those skilled in the thermodynamics of steam, is not as generally kept in mind among operative engineers as it ought to be, is that in the operation of a condensing engine the vacuum that can be maintained in a surface condenser depends

between steam at 180 pounds pressure and feed water at 120° F. (the latter temperature corresponding to the average vacuum maintained in condensing engines) as exists between steam at 60 pounds pressure and feed water at 50° F.; and as the boiler shell takes the temperature of the contained steam and water, and as the unequal expansion of the boiler caused by the feed is due to the temperature difference between the feed water and the contents of the boiler, the strains thus produced, assisted by the high pressures carried in modern practice, would injure boilers even more than was the case with cold feed water in the period of much lower pressures.

To obviate this destructive action, heating the feed water has become imperative; but a question has arisen as to the best methods of doing this, and at present it

by first utilizing the exhaust of pumps, &c., and then bringing the water to very nearly the temperature of the boiler by live steam taken directly from the boiler, according to current report, have given results that leave little to be desired. The apparatus used for the purpose is compact and accessible.

Of course the heat of the live steam used in this way all returned to the boiler, less a very small amount lost from exterior surfaces during its passage out of and back into the boiler. This loss by proper insulation can be reduced to a very small quantity, and the system seems a good one from either a scientific or a practical point of view.

The Michigan Peninsular Car Company.

The Governing Committee of the New York Stock Exchange has recommended that the following securities of the Michigan Peninsular Car Company be listed on the exchange: Two million dollars first mortgage five per cent. gold coupon bonds, dated September 1, 1892, due September 1, 1942, interest payable March 1 and September 1. The bonds are payable, as to both principal and interest, at the office of the New York Guaranty & Indemnity Company, New York, and may be registered as to the principal. Five million dollars 8 per cent. cumulative preferred stock, par \$100, the dividends on which are payable quarterly on the first days of March, June, September and December in gold coin. All certificates of preferred stock bear on their face the statement that the holder thereof will, upon any distribution of the assets of the company, be entitled to receive the par value of his shares before payment of the common stock, at its face value, can be made. Two million dollars common stock, par \$100, the dividends upon which are payable semi-annually. The holders of the common stock are entitled to such dividends in any year, after payment of all dividends then payable on said preferred stock, as the Board of Directors shall declare, up to 12 per cent. of the par value of said common stock, and after payment of the annual sum of \$80,000 into the surplus fund of said company, to such further dividends for the year as the Board of Directors shall declare. \$1,000,000 of the common stock remains unissued in the treasury, and it cannot be issued except for the purpose of enlargement of the business of the company, and then only by a two-thirds vote of the outstanding common stock.

Both classes of stock have the same voting power. They are both full paid and unassessable. There is no personal liability. In the event of the dissolution of the company, the preferred is entitled to payment at the face value before payment of the common stock at its face value can be made.

This company were incorporated August 3, 1892, and commenced business September 1, 1892, under the laws of the State of Illinois, and have acquired the property and assets of the following companies: The Michigan Car Company, the Peninsular Car Company, the Detroit Car Wheel Company, the Michigan Forge & Iron Company, the Detroit Pipe & Foundry Company, all of Detroit, Mich.

The net earnings for the three months ending November 30, 1892 (the first quarter of the current fiscal year), were \$372,008, which sum, after deducting \$25,000 for three months' interest on the company's bonds and \$100,000 for the quarterly dividend of 2 per cent. upon the preferred stock, paid December 1, 1892, leaves \$147,008.82 to the credit of the common stock. This is a satisfactory increase over the earnings of the several com-

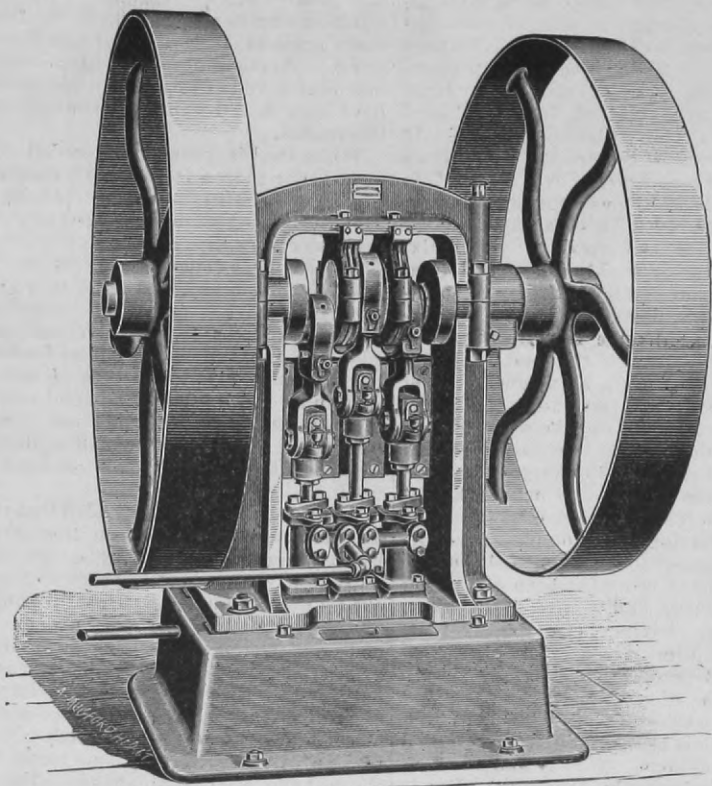


Fig. 3.

POWER PUMP FOR WATERBURY FARREL HYDRAULIC PRESSES.

primarily upon the temperature of the condensed water and in a jet condenser upon the temperature of the resulting mixture of condensed water with the water used for condensing that is introduced through the jets.

Water even when frozen into solid ice will generate vapor when the pressure is sufficiently reduced. The pressure in condenser is therefore just as much determined by the condenser temperature as is the pressure in the boiler by the temperature therein maintained; and the condenser pressure subtracted from atmospheric pressure determines the vacuum. No matter how perfect may be the action of the air pump, this limit cannot be passed.

It follows that in order to maintain an effective vacuum the condenser temperature must be low; and if the condensed water be returned to the boiler at this temperature, the effect upon the highly heated boiler must be nearly as serious as though, at pressures formerly in vogue, water at ordinary temperatures were used for boiler feeding. In fact there is almost exactly the same difference of temperature

may be said there are two parties to the dispute, one side ranging its forces in favor of heating by special heating appliances independent of the boiler, the other side maintaining that steam at high pressure or water at a temperature corresponding with the pressure maintained in the boiler, may be used for heating the feed water with greater economy than results from independent heating. There is nothing in the underlying principles of heat transmission to justify either of these positions. The question must hinge on purely practical considerations. Theoretically, the amount of heat required represents the same value no matter from what source it may be derived. Differences in economy, however, may easily result from practical causes, and in these must be sought the origin of any such differences found to exist between different systems. Thus, if in one method oil be more effectually separated from the condensed water than in another there should be a gain in economy in favor of the first system, unless it be otherwise deficient. Recent trials of the method of heating feed water, as taken from the condensing apparatus,

panies when they were operated separately, and demonstrates the wisdom of the consolidation.

The following is a general balance sheet as of November 30, 1892:

Assets.	
Unissued common capital stock..	\$1,000,000.00
Property account: Plants of	
Michigan Car Company, Penin-	
sular Car Company, Michigan	
Forge & Iron Company, De-	
troit Car Wheel Company, De-	
troit Pipe & Foundry Com-	
pany.....	7,720,536.05
Construction.....	1,225.02
Cash in hands of treasurer.....	537,104.24
Cash in hands of paymaster.....	2,049.35
Bills receivable.....	402,212.08
Material on hand and	
cars in course of	
construction:	
Peninsular car	
department.....	\$553,811.13
Michigan car de-	
partment.....	560,211.24
Michigan wheel	
foundry.....	71,483.43
Michigan soft	
foundry.....	90,052.94
Peninsular wheel	
foundry.....	50,624.45
Peninsular soft	
foundry.....	28,932.98
Forge department	
Pipe foundry.....	131,312.93
	94.44
	1,486,513.54
General office furniture and fit-	
tings.....	2,971.92
Accounts due from sundry cor-	
porations and persons.....	496,973.02
	\$11,649,585.22
Liabilities.	
Preferred capital stock.....	\$5,000,000.00
Common capital stock.....	3,000,000.00
First mortgage bonds.....	2,000,000.00
Pay rolls (due to employees).....	76,452.65
Bills payable.....	300,000.00
Accounts payable for material,	
freight, &c.....	935,498.75
Advanced payment for cars in	
course of construction.....	65,625.00
	\$11,377,576.40
Assets in excess of liabilities.....	272,008.82
	\$11,649,585.22

The total losses in the past few years upon sales amounting to more than \$100,000,000 are ascertained to have been less than \$5000. The officers of the company are: James McMillan, chairman of the board; Frank J. Hecker, president; Charles L. Freer, William C. McMillan, managing directors; W. K. Anderson, treasurer; Joseph Taylor, secretary; James McGregor, general manager mechanical department; Robert E. Plumb, general manager contract department; Safford S. De Lano, assistant treasurer; transfer agents, New York Guaranty & Indemnity Company; registrar of stock, Union Trust Company; trustee of the bonds, New York Guaranty & Indemnity Company.

Arthur W. Savage of Utica, N. Y., the manufacturer of the new Savage gun, met a number of capitalists at that city recently to whom he exhibited the workings of the new firearm. Mr. Savage and E. H. Risley have been in correspondence with the Colts Firearms Mfg. Company of Hartford, Conn., relative to having the company manufacture the new gun. No definite proposition has yet been received from the company, and should they not take it up, a company will be formed at Utica for its manufacture. Mr. Savage explained his gun in detail, and the difference between the smokeless nitro powder used in the shells and American powder. Upon a table was a large piece of seasoned hemlock, split in the middle. Into this a bullet from a Winchester rifle had been fired at a distance of 20 feet. In this test 56 grains of black powder had been used, and the penetration was $5\frac{1}{2}$ inches. Of smokeless nitro powder $35\frac{1}{2}$ grains were used in the test with the Savage gun, and the penetration

was $38\frac{1}{2}$ inches. The latter bullet was imbedded in the wood just as it left the shell, while the former was not.

Shipbuilding in England.

An analysis of returns made by the shipbuilding and marine engineering firms throughout the Kingdom to *Engineering* shows that the tonnage launched from the various yards in the Kingdom in 1892 is only 200 tons less than in the previous year, and 3000 tons less than in 1890, but 46,000 tons under the aggregate of 1889, when the total reached the highest point. The aggregate measurement of all vessels floated is 1,300,412 tons, and the total power marine engines constructed 1,003,529 indicated horse power. The latter is only about 2 per cent. less than in 1891, a greater number of engines for Government vessels constructed being counterbalanced by a lesser number of steamers having being built. The total tonnage given includes 50,450 tons, the displacement of nine vessels built in the royal dockyards at a cost of £2,920,431, and 90,750 tons, the displacement of 13 British warships constructed by private firms at an expenditure of over £5,000,000, together 140,200 tons, costing slightly over £8,000,000. This is considerably more than in the previous year. Excluding seven or eight cruisers and gunboats built for foreign powers, the merchant tonnage floated makes up 1,131,816 tons, considerable less than in 1891. A larger proportion of the total is sailing tonnage—22 per cent., as against 18½ per cent. in 1891, and assuming that three sail tons can only do the work of one steam ton, the total on the basis of steam tonnage is equal to 948,000 tons, against 1,081,000 tons in 1891. Ninety-eight out of every 100 tons of shipping built was of steel construction. A notable feature is that the proportion of the total tonnage built on foreign order has been decreasing for several years, and is now 15 per cent., the tonnage having been 188,312 tons, whereas in some recent years it was as high as 23 per cent. This, considering the growth of foreign marines, would seem to partly prove the statement that shipbuilding is being more largely adopted by foreign nations. Norway and Sweden, Germany (principally Hamburg), Russia and Austria were our principal clients this year. Of the remaining total of 1,000,000 tons, which were British owned, England takes three-fourths. Scotland 18 per cent., and Ireland 7 per cent. London is the first port this year, with 27.6 per cent. of the total; Liverpool, which was first last year, is second, with 25 per cent.; and Glasgow third, with 10 per cent. The Clyde owned 14 per cent. of the total tonnage, and north-east coast ports 17½ per cent. Messrs. Harland & Wolff, Belfast, have floated the largest tonnage of any single yard in this or any other year—68,614 tons, the total of 14 vessels; and the greatest engine power was produced by Messrs. Hawthorn, Leslie & Co., Newcastle—41,350 indicated horse-power. The largest vessel was the new Cunard steamer, built by the Fairfield Company; then came two Peninsular and Oriental steamers by Messrs. Laird of Greenock. Seven sailing ships were over 3000 tons, and the most noteworthy paddle steamer was the Glen Sannox, built for the Clyde by Messrs. Thomson, Clydebank. She is reputed the fastest paddle steamer in the world. The Tyne and Mersey alone show increases—due to warships launched, but the ports, as a rule, stand pretty much in the same position as they did at the close of 1891.

A lodging hall for the benefit of employees of the Homestead Steel Works was opened at Homestead last week. The

building is fitted up with all modern improvements and contains a large number of rooms, each of which is intended to accommodate two men. On the first and second floors the rooms rent for \$1.25 for each man, and the basement and attic rooms rent for \$2 each. The halls and rooms are covered with brussels and in-grain carpet and on each floor bathrooms are placed. The entire building is heated by steam and lighted by electricity.

Steel Versus Iron for Machine Construction.

Of the relative merits of steel and iron for machine construction there are many conflicting opinions. Hardly any two constructing engineers could be found who would wholly agree with each other upon this much debated question. The fact is that every one's experience—the only guide in a matter of this kind—differs in some respects from that of nearly every other. Applications of steel to, specific uses that have been successful in one shop, have been found wanting in other establishments.

While steel is generally conceded to be far superior to iron for rails, its merits for car axles are still much doubted, as appears from discussions of various engineering associations. The use of steel for stay bolts in locomotive boilers has been virtually abandoned, and there is a growing feeling that it is not as trustworthy for ordinary screw-threaded bolts as a good quality of iron, on account of its tendency to start cracks at the bottoms of threads, that under shock gradually extend entirely through the body of the bolt. Steel rivets have also begun to fall under ban on account of liability of the heads to crack off.

It must, however, be conceded that there are those who still maintain that steel is better than iron for many constructive purposes, while there appears to be no clearly defined majority either favoring or disapproving it. For instance, in the matter of piston rods, connecting rods, valve rods, &c., about as many may be found who would deprecate the employment of steel for these and analogous parts of machines as could be mustered into the ranks of its advocates. Some locomotive shops have, after trial, abandoned its use for these and kindred purposes.

When used in journals some think it wears away faster than iron, while others maintain that its tendency to heat or to wear is no greater. Some maintain that in axles it tends to crack and break off at the shoulders. Others assert that steel axles have been found liable to break in the middle.

For crank pins it has been found excellent, provided such pins are made large enough to prevent their springing under the strains to which they are subjected; if not so made they are apt to give even more trouble than if iron were used.

For tires of locomotives the use of steel is very generally approved. About car wheels there remains a wide difference of opinion. Some contend that steel maintains its integrity after incipient cracks are formed longer than cast iron, while flatly opposed to this opinion is the assertion made by those who have used both materials that the exact converse of the above statement is the real truth as to the relative merits of steel and cast iron for car wheels.

If any one thinks this statement of conflicting opinion is in the least exaggerated, he can verify all that has been written by the perusal of the proceedings of the January meeting of the New England Railroad Club, as printed in leading railway journals.

The secret of the uncertainty yet prevailing as to the comparative values of

steel and iron for machinery construction may rest in quality as related to cost. As one engineer at the meeting referred to said there is "steel and steel" and while poor steel is not so good as good iron, good steel may be had if any one wishes to pay its cost.

Electrical Training.

In view of the growing importance of electrical work in the industrial field, and the vast number of uses to which electricity is now being applied, a thorough system of combined theoretical and practical education for students in this branch of work is a thing greatly to be desired. A London contemporary recently drew attention to the prospectus of an institution in that city, which has lately been established with the object of supplying this desideratum to the youth of Great Britain. "The Electrical Standardizing, Testing and Training Institute," Faraday House, Charing Cross road, is designed, as its name intimates, besides undertaking the work of testing and standardizing electrical instruments, to give a thorough training, both theoretical and practical, to students in electrical engineering.

Heretofore two methods of education in this branch of science have been pursued in England—the workshop and the college system. In the former a youth is placed with a firm of manufacturing or contracting engineers, and works as an apprentice side by side with the ordinary workmen. Such training is very valuable, giving him a practical insight into working details which could be obtained in no other way. By this means the apprentice should at the end of his course have gained an experience which will make him a superior workman, commanding a good salary. But if he aspires to the higher walks of his profession, this mechanical knowledge must be supplemented by the necessary theoretical knowledge. The workshop training, therefore, is not a complete one.

In the alternative system the student follows a course of electrical education at some college or training institute, where he attends lectures by practical engineers and electricians, and applies the theories so imbibed to practice in the college workshops and laboratories. This is well, so far as it goes. But the objection to this method is that the college workshops are never like real workshops, and without a more practical training than is there available the college graduate will find himself woefully adrift when called upon to undertake serious work.

With each system, then, there is an incompleteness, and this lack the establishment above mentioned aims to supply by giving a due proportion of the advantages of both systems in its curriculum. The institute is stated to be in close relation with some of the leading firms dealing in electrical supplies and manufactures. In the workshops of these firms the institute students gain the needful practical experience, supplementing the theoretical knowledge gained in the classroom. They also get a valuable insight into the work carried out in the testing and standardizing departments of the institute itself. It is too early yet to speak of results, but the idea seems to be an admirable one, which, if carried out intelligently, should meet with good success in the training of thoroughly equipped electricians.

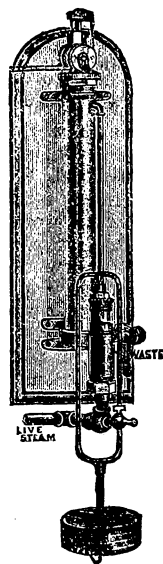
Wm S. Evans Lodge, No. 3, of the National Union of Iron and Steel Workers was organized among the employees of the Tenth street mill of the Oliver Iron & Steel Company at Pittsburgh last week. It is said there are about 50 members in this new lodge who were all formerly con-

nected with the Amalgamated Association of Iron and Steel Workers, but have severed all connection with that organization.

Automatic Damper Regulator.

It is stated that this damper regulator, which is made by G. M. Davis & Co. of 96 North Clinton street, Chicago, will operate a damper of any size on 1 pound variation of boiler pressure.

The valve is weighted to whatever pressure is desired, the normal position of the damper being open—held open by a weight on the arm. When the pressure in the boiler arrives at the set point the valve is forced up, opening the steam ports and admitting steam at boiler pressure under the piston inside of the cylinder, forcing it up and closing the damper by means of the cord or chain run from the end of the piston rod under the pulleys and connected to the damper arm. This position is maintained until the pressure falls 1 pound, when the weights bring the valve down, closing the live steam ports and opening the exhaust ports. The pressure



Automatic Damper Regulator.

being taken off the piston, it is pulled down by the weight on the damper arm, the steam in the cylinder under the piston being exhausted through the exhaust ports into the waste pipe, which can be run into the ash pit or other convenient place. The amount of condensation passed by the waste pipe will seldom exceed a pint in every 24 hours.

The rough experience of ocean-going steamers this winter has demonstrated more completely than before that strong bulkheads are essential to the safety of the ship. Mr. Cramp is quoted as saying that the problem is now completely solved. Until late years the bulkhead was merely a help; now it is a security. As now built each bulkhead in a first-class steamer is as strong to resist water pressure as the hull of the ship itself. The "Umbria," Mr. Cramp declared, while anxiety was greatest concerning her, "would float safely in any sea, even if her whole bow were stove in or her stern cut off. She was built to do that, and her builders knew their business."

The Cataract Construction Company will award next month a contract for the construction of dynamos of 5000 horse-power, the largest ever built, and also for a system of transmitting the power from the generating station.

Mr. Carnegie's Manifesto.

The somewhat unexpected visit of Andrew Carnegie to this country has been the source of a good deal of speculation and comment, and has given rise to some uneasiness in certain quarters, since it was expected that some particularly aggressive movement in the markets might grow out of it. It will be noted that Mr. Carnegie reiterates the statement that he has retired from business, but that he will give his associates "his best advice, when asked." The trade will possess a fruitful topic for guessing in what branches of the extended operations of the concern his best advice is now being asked. We print below Mr. Carnegie's statement:

"I did not come to Pittsburgh to rake up, but to try to bury, the past, of which I knew nothing. That is beyond recall; it should be banished as a horrid dream, and only the lessons that it teaches laid to heart for the future. For 26 years our concerns have run with only one labor stoppage at one of its numerous works, and I trust and believe that even this record will be fully equaled in the 25 years to come. When employer and employed become antagonistic, each considering the other its enemy, it is a contest between twin brothers. There is no genuine victory possible for either, but defeat for both capital and labor.

Retired from Business Four Years Ago.

"I desire now, once for all, to make one point clear. Four years ago I retired from active business; no consideration in the world would induce me to return to it. A great error of our countrymen is that they endure the harassing cares incident to business until they break down in the harness, when they should be in their prime, and die, still striving for dollars. I believe in retiring betimes and giving younger men a chance. I have sold portions of my interests and am gradually selling more to such young men in our service as my partners find possessed of exceptional ability and desire to interest themselves in the business. I am not an officer in the company, but only a shareholder.

"To the numerous appeals which I have received urging me to give instructions in regard to recent troubles I have paid no attention, but to all these people, and to any others interested in the subject, let me now say that I have not power to instruct anybody connected with the Carnegie Steel Company, Limited; the officers are elected for a year, and no one can interfere with them. Even at the next election, if I desired to make a change I should be powerless to do so. The law under which the company is chartered requires a majority, not only in interest, but in number, of shareholders to effect a change. If I desired to replace the present officers, therefore, it would be necessary for me to obtain a majority of the shareholders, and also seven members willing to act as their successors.

The Present Management Will Remain.

"I could not find one shareholder out of the whole number interested that would not vote and stand by the present officials. They will be unanimously re-elected. I do not believe in ruling through the voting power, even if I could, and this provision, which has always been a feature in our partnerships, I think is only fair to those I could otherwise outvote. When I could not bring my associates in business to my views by reason I have never wished to do so by force. As for instructing or compelling them, under the law, to do one thing or another, that is simply absurd. I could not do it if I would, and I would not do it if I could.

"I am still a holder of the majority of the shares of the Carnegie Steel Company, Limited, never having changed my policy of concentration. I made my first dollar in Pittsburgh and I expect to make my last one here, and as long as my young partners are willing, or desire my capital to remain in the business, it shall so remain, and they shall always have my best advice when asked, gratis.

"I elect to retain my capital in the manufacturing business I have helped to build up, because I have, and always must have, great pride in it, and for the further reason that my capital is thus made the direct employer of labor; it furnishes many men with steady work at good wages. I do not know any form of philanthropy so beneficial as this. There is no charity in it.

Will Not Hoard Money.

"I have not taken money out of the business for investment in outside things. I never intend to do so, and since I retired from business four years ago, when money has come to me beyond that required for living expenses, it has been devoted to public uses. I have hoarded nothing and shall never accumulate money. I shall not die rich apart from my interest in the business, which may still be held at my death. Much has been said about my fortune. I have plenty only if the works in Pittsburgh are prosperous; unless they are, I have nothing, and that is how I elect to stand. All my eggs are in one basket, right here in Western Pennsylvania. I take my chances with my partners, and I have the satisfaction of knowing that the first charge upon every dollar of my capital is still the payment of the highest earnings paid to labor in any part of the world for similar service. Upon that record I am proud to stand.

"And now, one word about Mr. Frick, whom I recommended to the Carnegie Steel Company, Limited, as their chairman and my successor four years ago. I am not mistaken in the man, as the future will show. Of his ability, fairness and pluck no one has now the slightest question. His four years' management stamps him as one of the foremost managers in the world. I would not exchange him for any manager I know. People generally are still to learn of those virtues which his partners and friends know well.

Strong Faith in Mr. Frick.

"If his health be spared, I predict that no man who ever lived in Pittsburgh and managed business there will be better liked or more admired by his employees than my friend and partner, Henry Clay Frick, nor do I believe any man will be more valuable for the city. His are qualities that wear; he never disappoints; what he promises he more than fulfills. Good workmen or able men who wish to do what is fair and right will learn to appreciate Mr. Frick. Inefficient officials or bad, unreasonable, violent workmen he does not like, and these will not thrive with him.

"I hope after this statement that the public will understand that the officials of the Carnegie Steel Company, Limited, with Mr. Frick as their head, are not dependent upon me, or upon any one, in any way, for their positions, and that I have neither power nor disposition to interfere with them in the management of the business. And, further, that I have the most implicit faith in them. I hope also that I shall be thought a very wise man in having retired from the cares of business before old age set in, and that the public will agree that a record of 40 years of hard work entitles one to devote his remaining years to less exacting and more congenial pursuits. We know, however, upon the best authority, that where the treasure is, there will the heart be also. Well, all my

treasure is here, in and around Pittsburgh, and my heart, wherever I go, can never be very far off, and this I can most truthfully say, that one of the chief thoughts of my life must always be, how I can best repay the inextinguishable debt I owe to the once again smoky, but still dear old Pittsburgh."

COKE.*

BY JONES WISTER.

Having been a manufacturer of metal for so many years gives me an opportunity to explain some of the difficulties which surround the furnaceman whose whole desire is to sell the foundryman a metal which will best suit his wants. The fuel used in the smelting of the ores has the greatest bearing upon the results.

In the year 1867 J. & J. Wister built a blast furnace in Harrisburg, which was then and still remains one of the best manufacturing sites in Pennsylvania.

Anthracite furnaces at that time made from 15 to 25 tons of pig iron during every day of 24 hours. Ours was expected to make 16 tons daily but exceeded the limit, until 20 tons became the daily average. At the end of the fourth year we had earned more than enough to pay for the plant, and our firm had an enviable reputation in the business world. Anthracite from either the Schuylkill or the Wyoming region was our only fuel.

I was the business manager and employed a founder to work the furnace, who, after the fashion of the "rule of thumb" times, was a superior furnaceman.

Things were working smoothly, pig iron was in great demand, and we had just made a contract for 5000 tons of No. 3, No. 2 and No. 1 iron, at \$42, \$44 and \$46, respectively, when, on September 17, 1873, the great banking firm of Jay Cooke & Co. failed. We were out of blast at the time, but after repairing we blew in and filled the 5000-ton contract at a handsome profit.

The times, however, had undergone a complete change since we had been in the market, and when we again had metal for sale at a high price the buyers had disappeared.

Other changes were going on in the iron trade, especially west of the Alleghenies. The Lake Superior ores were coming into the Pittsburgh and the Shenango markets in large enough quantities to keep the price of metal in that important market lower than the makers cared to see it. Furnaces which, like our own, had been built to smelt 20 tons per day were turning out 50 tons per day; others built five years later were expected to make 75 tons, or perhaps even more, but when reports came that a furnace in Pittsburgh was making a daily output of 100 to 125 tons, many declined to believe such a wild statement.

The constant decline in metal values from month to month and from year to year brought about great economies in furnace practice, which the years of prosperity and high values would never have accomplished. The year 1876 brought the Centennial, 1877 the railroad riots, while 1878 brought coke from the West to stimulate our slow anthracite fires; for by this time it had become apparent to many of us that, at our then rate of speed, we were out of the race.

Among the economies practiced by our firm was the discharge of our founder, who had not kept pace with our requirements. I had taken a course in chemistry and conducted many chemical experiments, and had learned to analyze ores, limestone and metal, which, together with the

necessity of constantly watching the founder, led the firm to try the experiment of working the furnace through the office. One of our first moves, after the large yields in the Western furnaces had become established, was to experiment with coke. This we did in a small way at first, but after establishing confidence in the fuel we continued its use from one-quarter to one-half of the furnace charge as long as we continued in business. During the last two or three years of our history we had increased the yield of our furnace to a daily average output of about 40 tons, which on many days reached 45 to 50 tons, or about three times as large a tonnage as we had expected when we built. Coke played a very important part in causing this increased yield.

Furnaces between the years 1868 and 1873 consumed 1½ to 2 tons of fuel per ton of metal produced. At the present time few furnaces burn more than 1½ tons of fuel per ton of metal, while the best practice shows 1900 pounds to a ton of output. In cupolas the best practice has shown 10 tons of metal melted per ton of fuel. It therefore follows that even to-day, when the best practice ever known in furnaces is being shown, that the furnaceman is ten times more interested in fuel than the foundryman, who burns only 1 pound in 10, or in every-day work perhaps 1 to 6, 7, or 8 is nearer the truth.

The cupola is a baby blast furnace, requiring the stimulant of rapid combustion as much as and perhaps more than the furnace. The virtue of conservatism has prevented some foundrymen from using coke, while the lack of the knowledge of the real advantage of coke as a fuel has prevented others.

Coke being a manufactured article is subject to many irregularities, which many foundrymen have no doubt discovered to their cost. These irregularities arise from various causes:

1. The general character of the coal of the region used in its manufacture.
2. The character of the particular coal used, if in its normal condition or reduced in value by sulphur, slate or ash.
3. The burning of the coal into coke after being dumped into the ovens.
4. The amount of water absorbed through weathering.

Coking coals exist in Pennsylvania from the East Broad Top region to the Ohio border. The semi-bituminous coals carrying a minimum quantity of about 15 per cent. of bitumen or volatile matter, the mountain coals carrying about 20 per cent. of bitumen or volatile matter, and the Pittsburgh seam, which embraces the Connellsville and gas coals, carrying the maximum amount of about 30 to 35 per cent. of bitumen or volatile matter. Coke from all these regions is used by foundrymen, but that from each region has its own peculiarities. Beginning at the East, the coke from these various coals for foundry use may be said to be good, better, best. Of the coke made from the Pittsburgh seam the Connellsville is so pre-eminently superior to all others that it is frequently complimented by imitations, which salesmen do not always allude to when offering their coke to customers.

Good results in either cupola or blast furnace practice depend upon the character of the fuel. Foundrymen expecting to realize the advantage which can be obtained from the use of coke should examine each shipment before using, and a careful study of fuel is not only interesting from a business standpoint, but will be found full of pleasure for the scientific mind. Buyers should therefore make a personal examination of every car of coke if they expect good results. Mountain or even Broad Top coke may not be a bad substitute for Connellsville, provided the coal used is the best product of the mines and the burning has been perfect, but,

*An address delivered February 1 before the Foundrymen's Association of Philadelphia.

all other things being equal, Connellsville is the best coke for foundry practice.

The appearance of a good article of fresh burnt coke should be a dark, shining gray mass. Examined more closely the fracture of the cross section is found to be honeycombed with air cells from the size of a pin point increasing up to the size of the head of a large toilet pin; while upon the longitudinal surface it will be found that the intense heat which permeates the seams of the burning mass has caused the silex and other easily melted material in the coal to run over the surface, covering it with a beautiful gloss in some parts and with shining beads in other parts. At the base of each oven of burnt coke will be found a small amount of what is known in the trade as "smutty coke," or only partly burned coke, which should not extend over $\frac{1}{2}$ to 1 inch up the mass, and then only on the surface. These are the general features of every good coke, nor do we believe it makes much difference what region a thoroughly well burned coke emanates from, for it will answer its purpose equally well.

The increased cost of manufacturing a perfect coke from coal not adapted to the use causes almost all the owners of such coals to market them as coal rather than invest a large amount of money upon a manufacture the nature of which is hazardous. The failures come chiefly from a lack of bitumen to perform the coking service within the time necessary to make it a commercial success. A series of experiments looking to the making of coke from anthracite culm was tried some years ago by the writer, the results of which show that by the addition of $\frac{7}{8}$ to 10 per cent. of raw bitumen (such as is produced in gas retorts) an unsatisfactory coke could be made; 15 per cent. improved it, while 20 per cent. made a splendid hard coke which would scratch glass. It may also be interesting to know that one half anthracite culm and one half of any gas coal mixed and burnt will produce a coke of superior quality, but at a cost far beyond its commercial value.

The buyer should also know the characteristics of second quality and also of distinctly bad coke. If the general character of the coal from which the coke is baked is slaty the cross fracture will invariably show any slate which the mass contains. As slate and coke are of almost the same color it is absolutely necessary to make the fracture or else it is not likely to be discovered except by the loss of heat units in the cupola. If slate occurs only in minute pieces and not in large numbers the buyer has no just cause for complaint, as coal is scarcely ever entirely free from slate. If, on the contrary, the pieces of slate are frequent and of large size varying from that of the thumb down to pieces the size of a grain of corn and the fracture of many pieces show the same bad qualities, the buyer would be justified in rejecting it or asking for a reduction.

All fuel, whether anthracite or coke, contains from 8 to 10 per cent. of ash. If slate predominates in the ash the buyer secures a given quantity of alumina. This some foundrymen pay high prices for in the metal aluminum, which, if used in proper proportions as a flux increases the fluidity of the iron melted and requires a less proportionate amount of fuel for melting purposes.

Sulphur is perhaps the worst ingredient which coke contains, for it not only forms an alloy with the metal, but changes the graphitic carbon into combined carbon (which is only another name for "Hardening") and also reduces the heat of the flame by its presence. Sulphur cannot be discovered in coke by eyesight. It therefore behooves the user to inquire about the analysis of the coke and whether it is a 48 or 72 hour coke.

These remarks may all be said to be the simple rule of thumb methods of the trade by which it learns to defend itself against the ubiquitous and iniquitous coal man. But there is a scientific principle underlying the practical and growing out of it which the chemist and investigator has given to the world through the American Institute of Mining Engineers. One of these gentlemen entered upon the search for reasons why coke was better than anthracite as a fuel and discovered that an average piece of coke contains about 55 per cent. air cells, or, in other words, it is porous like coral. This physical construction permits the oxygen of the air to penetrate it and causes combustion to be free and general in all its mass. Anthracite, on the contrary, though generally somewhat freer from impurities than coke, burns upon the outside only. Throw upon the floor pieces of both fuels heated to a red heat and watch the result; the anthracite will soon change its color to that of its ash and within a very short time presents no appearances of heat, while the piece of coke will, because of its porosity, continue glowing until consumed. It carries its burden in the blast furnace as well as hard anthracite and better than soft anthracite, while it performs its given duty in about one-half the time. Herein constitutes its great advantage as a fuel in the blast furnace. For the cupola its ability to carry a burden is of greater importance; for the difference in specific gravity between the charges are greater than in the blast furnace and the melting is more rapid. So every advantage that coke has over anthracite in the blast furnace is enhanced in the cupola in proportion to the difference between the specific gravity of coke, limestone and ore and that between coke and pig iron.

These remarks would seem to indicate that if rapidity of combustion is wanted in a cupola pure coke can be depended upon to provide it. The foundryman must, however, rely upon his own judgment as to whether he requires rapid combustion or not. He may, however, be sure of one fact, proved beyond peradventure or doubt by the good and bad working of blast furnaces as observed by hundreds of furnacemen—viz., that fuel which will best withstand the oxidizing effect of the carbonic acid gas, which is constantly passing upward through the descending column of fuel, iron ore and limestone in the blast furnace or of fuel oyster shells (or whatever flux may be used) and iron in the cupola is the standard fuel for either furnace or cupola use. In furnace practice east of Harrisburg that fuel has been found to be a mixture of one third to one half coke and the remainder hard anthracite. This standard has been arrived at from a combination of physical and commercial conditions.

Having given you the most salient and interesting points upon coke, perhaps a few remarks upon anthracite as a heat producer may be in order.

No experiments have ever been tried, either by others or myself, which have shaken my faith in the fact that 1 pound of the best anthracite contains fewer heat units than 1 pound of any other fuel in existence. But we live in a progressive age, and all experiments prove that notwithstanding the existence of the heat units in anthracite, so large a proportion of them remain latent that for the purposes of the furnace or foundrymen they might as well not be there. When the differences of blast pressure used in furnaces and cupolas (which for practical purposes may be taken as seven to one) is considered, the advantage of a fuel easily penetrated by the blast are enormously in favor of coke.

Many will wonder why the coke made from a highly bituminous and volatile coal is so superior to that made from coal low in volatile. The first thought would be

that the higher a coal is in volatile matter the greater the waste in the production of coke. The results do not prove this to be true, but on the contrary do most conclusively prove that low volatile coals produce cokes of least value from an analytical standpoint; yet from a physical standpoint the high volatile coals produce coals which are best suited to the wants of those who melt and smelt.

I have never seen an analysis of a coal in which bitumen and volatile were noted separately, nor can a chemist properly take cognizance of the two substances. Yet the coal tar of commerce, made at every gas works in large quantities, is a proof that though it is volatile yet it returns to the liquid form in quantities large enough to become a source of revenue to all companies who distill gas from coal. If this substance exists in a coking coal in larger quantities than that demanded for coking the mass, it remains within and permeates it and itself burns into a coke of a character much more solid and compact than coke made from low volatile coals.

The characteristic of coal from the Pittsburgh seam is that of high bitumen, volatile or gaseous, and gives to coke made from it the high value which has made it a commercial standard.

It was our custom to purchase the burnt-out retorts from the Harrisburg Gas Works, which were hauled to our works before being broken. An extremely hard, dense coke was found in these retorts, which attached itself to the iron and was almost as hard as anthracite coal, but of a tough, solid nature. It is known at gas works as carbon. Foundrymen have used it and I am told it once had and perhaps now has a high commercial value. It was coke made from the bitumen of the coal and not from the so called fixed carbon. Fixed carbon has great value for all purposes for which coal can be used, with the single exception of coke baking. If it were equally valuable for making coke then every coal of high or low volatile would be equally excellent for that use. But no, the high volatile coals alone make the superior cokes.

This feature has not, as far as I am aware, ever before been noticed. The facts are all recognized, but if this application of them has ever before been presented it has not been my good fortune to have met with it. Should this suggestion prove correct, I most cordially thank your association for inviting me to participate in your meeting; for though the whole scientific world of coal miners and users have been investigating the values of cokes made from widely different seams of coal, no one of them has been able to point out the reason why Connellsville is better than almost any other.

The long-pending revolution in the Hawaiian Islands has taken place, and the Provisional Government, whose members are mostly American born citizens or their descendants, are represented in Washington city at the present time by an influential deputation instructed to urge annexation to the United States. American interests in the islands are said to equal \$30,000,000—three-quarters of the entire foreign investment. One of the most prominent business men of Honolulu states that Honolulu, the capital, has a population of 23,000, while the population of the country is 90,000, and the area of the Hawaiian Archipelago is equal to that of Connecticut, Rhode Island and Delaware. During 1891 the percentage controlled by the United States of the total trade of the islands fell off 4.39 per cent., but it was still enormously in the lead. During that year the total imports of the islands were valued at \$7,439,482.65, of which 71.16 per cent., or \$5,294,278.57, were imported

from the United States. Great Britain in the same year sold the islands \$1,201,329.43 worth of goods, or 16.15 per cent. of the total imports. During the same year the total exports of the islands were \$10,258,788 27, of which the United States took nearly all. Last year sugar culture in the islands is said to have been without profit.

San Francisco News.

The imports in 1892 of hardware, horse-shoes, &c., have increased largely; so also have those of bar and bundle iron, wire, &c. We refer now to the imports by sea. Those by rail have fallen off in the same time. There has been a falling off in the imports of pig iron and in those of scrap, too. This indicates a less active demand by our rolling mills. The price of nothing except pig iron has varied much during the year, but pig iron has fallen about \$3 a ton in the interim. In the matter of tin plate there has been a decided increase in imports, the total exceeding 370,000 cases, a good deal in excess of that of 1891. There has been a cut down of about 20 per cent. in the salmon pack; but, as appears from what we can tell at present, a decided increase in the production of canned goods. All the year the canners kept talking about a restriction of the output; but they evidently did not practice what they preached. The result is that the market, which had at one time descended to about \$5 75, has again advanced to \$6 @ \$6.10. After a series of fluctuations within a narrow range, pig tin closes at, say, 21½ cents, or about ¼ cent per pound higher than it opened. The Cajal o tin mines were worked for a while during the year on a small scale; but soon after the attacks by the *Examiner* the working closed, whether temporarily or permanently none but the English stockholders at present can tell. We had at least the satisfaction of receiving and using a small quantity of California tin here in San Francisco; but this was a poor satisfaction after the dreams and the brilliant journalistic prognostications of, say, 40 years. We were awakened out of our dream at last and find out that we have either no true tin lodes within the precincts of the State, or that it will take many other long years to develop them. The shutting down of the mine was largely due to political opposition, as but for the statements made about the mine and the fears excited in the minds of English stockholders operations would probably be going on still.

A number of the steel and iron men of the city have signed a petition for the reduction of the tariff on various articles in iron and steel raw materials. Certain it is that a reduction in the tariff would benefit California, as it would give the raw material at a figure with which the manufacturers of the East could not compete. The people of California generally view it in that light, and as to the difference of opinion between them and the manufacturers on this point, deponent at present sayeth not.

One of the pillars of the iron industry in this State, Egbert Judson, died the other day. He went much beyond the allotted span, having reached the age of 81. He was interested in the Clipper Gap Iron Mines—one of the failures in the iron industry in this State. They never netted him anything, but helped to mar the business interests of many confiding stockholders. For a while there was a great to do about Clipper Gap iron, but on the fall in prices it finally came to naught. There is, however, a good deal of iron in sight, and with the proper capital and energy and low freight rates the mines will be enabled to add much to the world's stock of iron. Mr. Judson was one of the

principal promoters of the nail company, and the Judson Iron Works, that has permanently lowered the price of iron in this market. The reduction was made during the year. He was interested in many other enterprises, and though reputedly a millionaire, lived as poorly as a mechanic and dressed in the same style. He had his meals at a second-class restaurant. He never married and his vast estate goes to his relatives. He did more for San Francisco's industries than a dozen of our wealthy capitalists combined. He adventured his money when success was problematical and did not, like so many others, wait to have some one else prove it.

Business has been quiet during the past three weeks. The weather has been mainly fine, clear and cold, and though matters have been quiet there has been more stir in the market than is usual at this time of the year.

Imports both by sea and rail, though not large, have been of fair volume. By rail for the two weeks ending January 9 they have been: 7 cars of agricultural implements, 1 car of pipe, 4 cars of machinery, 7 cars of iron, 4 cars of steel, 5 cars of hardware, 1 car of wagons, 3 cars of stoves, 1 car of wire netting, 1 car of washers, 1 car of castings; 2 cars of safes, 1 car of plates, 3 cars of ranges—total, 41 cars; and 31,152 pounds of zinc, 871 plates of spelter, 5540 pounds of lead, and 2420 pounds of copper.

Municipal Inconsistency on the Smoke Problem.

The importance of smoke prevention in large cities can hardly be overestimated, and it was due to this fact that an organized body of influential and public spirited citizens of Chicago was incorporated about a year since, with the sole object of waging a war of extermination on the smoke makers. The result of not more than nine months' systematic and determined enforcement of the city smoke ordinances is suggested in the following paragraph:

Smoke Inspector George of the city health department is at work upon his annual report. He expects to present it to Dr. Ware, city health commissioner, the last of the week. The report will make a showing as to the condition of the city in regard to smoke. In regard to railroads it will be shown that in the matter of smoke prevention their condition is 85 per cent. better than a year ago. Mr. George has compiled reports from every railroad giving the number of locomotives in use and the number equipped with smoke-preventing devices.

"An encouraging sign of the times," said Mr. George yesterday, "is that all the new buildings now in process of construction almost without exception are being equipped with smoke consumers. The railroads, too, are showing the utmost willingness to abate smoke and seem to be doing all in their power to do away with the nuisance. This shows that the public is getting hold of the idea that smoke can be abated and are desirous of taking the trouble necessary to that end.—*Chicago News Record*."

At the commencement of the crusade the public in general, and the "smoke breeders" in particular, were very skeptical as to the possibility of any really important degree of success being attained, and it was a popular belief that smoke-preventing devices were effective only when there was no fire in the furnace.

There can be no doubt that many of the proprietors of establishments whose chimneys were like young volcanoes would have been glad to avail themselves of any reasonable means of stopping their contributions to the objectionable cloud, and to this end a great deal of money has been spent on worthless devices until all further efforts were abandoned in disgust. Of course there was also a large number who took a purely selfish view of the matter and cared very little whether or not the community suffered from their smoke, their sole desire being to evade the provisions

of the law so long as it was not rigidly enforced.

The function of the organization is not in any sense official—it merely exercises the right of any private citizen in calling attention of the executive branch of the city government to the continued infractions of the municipal laws, and demanding that the offenders be compelled to pay the penalty. The first batch of prosecutions—comprising a long list of manufacturers and steam users, many of whom are prominent business men—had the effect of opening the eyes of the public to the fact that the movement was in earnest, and that it behooved the offenders no longer to consider the law a dead letter. By employing a large corps of engineers, under a competent chief, the society was enabled not only to inspect the offending plants, but to suggest the necessary remedy; and the result has been, as indicated in Inspector George's report, that numerous efficient devices have been developed and applied. In most cases the prevention of smoke, instead of entailing an additional expense, is actually a source of economy, owing to the more perfect combustion of the fuel, and this fact once realized will be an important factor in the ultimate outcome of the movement.

There is, however, a striking anomaly in the situation. While the city government is, at short intervals, imposing fines upon long lists of violators of the smoke ordinance, the city itself is unquestionably the worst of the offenders. It is a fact patent to any observer that the chimneys of the public schools and other city institutions emit the densest clouds of the blackest smoke to be found within the corporate limits of Chicago, and have done so unmolested (apparently) during the entire period in which private citizens have been punished for the same offense, though committed in a lesser degree. There is neither consistency nor fair play in this. If a city official in an official report can state that the necessary means for smoke prevention are available and in use by private citizens and corporations, it logically follows that the same devices are available for the use of the city. It is rather a parody on justice for the law-maker to punish the individual for violations of the law which itself violates. The nuisance of school-house chimneys is aggravated by the fact that they are situated, almost exclusively, in residence neighborhoods where one would naturally expect immunity from nuisances which might be considered excusable in a manufacturing district.

Enlargements and improvements of a very substantial character are now under way at the works of the Terre Haute Car & Mfg. Company, at Terre Haute, Ind. The Terre Haute *Express* prints a *résumé* of the business of the company in 1892, which shows that the year witnessed a large increase in business, improvements in the company's properties and financial success. Two large brick foundries have just been completed and equipped with machinery of the most modern design, and a large amount of new machinery has also been added to the several other departments. Ten additional acres of land have recently been purchased, on which three buildings 400 x 40 feet each will be erected for repairing purposes. The entire plant when completed will cover an area of 39 acres. During 1892 about 4000 cars were built, an increase of 600 over 1891, and 700 cars were repaired, or an increase over 1891 of 200. The firm employ 870 men, and paid out over \$400,000 for labor alone during 1892. The works are capable of turning out 15 complete box cars daily and of making all kinds of cars except passenger coaches. The new wheel foundry is 300 x 80 feet, and has a capacity

of 240 wheels a day. The company will make a specialty of wheels for railroad and street railway cars. During the present year, with the completion of the new repair shops, the company will also make a specialty of repairing cars, which business has heretofore been unsolicited. The company were formed in 1867, James Seath being the founder. In 1875 the present company were incorporated. Nearly the entire works were destroyed by fire in July, 1887, but were rebuilt. The plant as at present erected includes the following buildings, exclusive of the buildings already enumerated as in course of construction, besides numerous smaller buildings comprising offices, supply rooms, &c.: Erecting shop, 156 x 257 feet; blacksmith shop, 118 x 176 feet; planing mill, 232 x 175 feet; machine shop, 114 x 126 feet; wheel foundry, 80 x 300 feet; soft foundry, 120 x 240 feet; repair shop, 75 x 200 feet; repair foundry, 75 x 120 feet.

Duluth News.

The Minnesota Iron Company are preparing for a forced output on the Vermilion range this winter, and expect to ship over the Duluth & Iron Range road during 1893 nearly 80 per cent. more ore than in any previous season. This will give the road a tonnage of not far from 1,800,000 tons, and this amount is just what the company have prepared themselves to easily handle. The opening of the Mesabi and the building of the Duluth, Mesabi & Northern road has not, evidently, had any effect in causing a curtailment of operations in the hard ore mines of this county, at least not yet. It is now generally believed that the Mesabi road will not be able to handle in the coming season more than 400,000 or 500,000 tons of ore on account of the fact that its line must be built into this city—24 miles—and its ore docks built before it can do much of any business. Most of the mines on the road will not be able to ship any quantity of ore before July, the frost proving a very serious detriment to the steam shovels and strippers. The mines of the Duluth district, therefore, present a possible output of 2,400,000 tons for the season of 1893.

The output of the Minnesota company's mines and of the others that will be shipped over the Iron Range road will be as follows, according to the present expectations of the railway officials:

	Tons.
Minnesota Company's mines, at Tower..	60,000
Minnesota Company's Chandler, at Ely..	700,000
Zenith Company's Zenith, at Ely.....	120,000
Pioneer Company's Pioneer Mine at Ely	25,000
Cincinnati Mine at Merritt (Mesabi Range).....	250,000
Hale Mine, at Merritt.....	50,000
Minnesota Company's Canton Mine, at Merritt.....	50,000
Total.....	1,795,000

The Minnesota Company, at their Tower mines, are mining more ore to the man than ever before, consequent on the completion of the change from the early open pit method to the present back stoping system. The expense of getting out ore is considerably reduced by this change, and it is well for the big Minnesota that it is so. One heavy ore crusher, capable of handling over 200 tons a day, about all the large masses that will come from one shaft, is at work at the mine, and it is so satisfactory that three more will be set up at the main shafts of the mines. These crushers are expected to allow the hard hematites of the mines to compete with the soft ores of the Mesabi. A large 4 drum hoisting engine and a compressor plant are being installed at the Minnesota to operate three shafts, by Webster, Camp & Lane of Akron, Ohio. At the Minnesota there are already in stock pile some 150,000 tons of ore and more is being hoisted, at the rate of 2500 tons daily. There will

be considerably over 300,000 tons in stock by the opening of navigation. The great Chandler Mine of this company will have nearly 400,000 tons in stock pile by the opening of navigation. It is hoisting 3000 tons a day. The Zenith Mine at Ely is a new property owned by Duluth men and has made a very fine showing with the half dozen cargoes shipped last fall. The mine will operate four levels this season and is down 425 feet. The Pioneer Mine is owned largely by ore shippers of Cleveland, and is putting down an 800-foot shaft. It is down nearly 300 feet now, but will not be in position to get out more than a small amount this year. It is on the Chandler vein and will prove a most excellent mine.

At Merritt the Cincinnati Mine is operated by the Standard Ore Company of this city. It has a stock pile of 20,000 tons. It is the only large Mesabi property that, at present, is being operated by the back stoping system, though it will not be the only one that will in a year or two, if the ideas of *The Iron Age* correspondent are not very much at fault. It is shipping 200 tons a day to the Duluth coke furnace, and that plant was blown in last week on this ore exclusively. The first run of metal from these soft ores of the Mesabi range took place at this furnace recently, and it was indeed an event in the history of the new range. Furnacemen have generally believed the Mesabi ores need a mixture to work well, but the contrary has been proven. The Hale Mine is also to be operated by the Standard Ore Company, and a large hoisting plant has been bought for use there. The Hale has a share of non-Bessemer ore, but some very fine Bessemer has been found. The Canton Mine at Merritt is the only Mesabi property now owned by the Minnesota Iron Company, and may get out a much larger shipment than it is credited with in the above table. It will work two shafts, one of which is now down 90 and the other 50 feet. The mine will begin mining ore in February.

A bitter fight has been precipitated here between the Duluth, Mesabi & Northern and some other party, believed to be the Duluth & Iron Range road, that may have a very serious effect on the immediate future of the head of the lakes as a manufacturing point for iron and steel, and on the Mesabi range as well. As near as can be ascertained, for it is very hard to get the facts, and they have not been published here, some one, alleged to be the Minnesota Iron Company, has been endeavoring to get control of the Mesabi road and the Biwabic and Mountain Iron mines, the majority of stock in which has been and is still, happily for this section, held by the Merritts, a family of Duluth explorers and iron men. The unknown company bought for something like \$120,000 the stock in these properties held by T. Foley, one of the contractors who built the road. It then secured options on with in 500 shares of a majority of the stock of the properties, but the Merritt family having these 500 shares, it was unable to get enough. The Merritts were then offered more for their shares in these three properties than they themselves considered them worth, but refused the offers, as they are deeply interested with their friends in many other Mesabi locations, and believed that these would be rendered valueless by such an operation. Legal steps were then taken to delay the Mesabi road and stop a deal, heretofore fully referred to in these columns, for the securing of large amounts of money for the Mesabi roads and docks. This matter is now before the courts and will be settled in a very short time. It is needless to say that the sympathy of all at the head of the lakes is fully with the new road and the Merritts, for their interests are all here, and they are well known and highly respected local men who never went

back on their friends. If their friends had never gone back on them they would not have found themselves in such embarrassment as at present. The Mesabi people believe they can ward off the suit on several grounds, one of which is that the man who alleges the statements on which application for injunction was made is not a stockholder of record; another being that if the court annuls the contract sought to be set aside, the road will go back to original hands, the Merritts only, leaving out all others. Officials of the Duluth & Iron Range road here deny that their company are in any way bringing this suit.

The plans of the Mesabi road, which are placed somewhat in jeopardy by this complication, include very large iron smelting and steel-making plants in this city, and for these developments the money was all arranged for and ready. Blast furnaces, Bessemer plants, nail, plate, beam, bar and other mills are included in the plan, and in five years Duluth will be, unless there are too great hindrances to be overcome, one of the greatest iron manufacturing centers in the United States. Minnesota has a statute under which the only taxation placed on mines and manufacturing plants is 1 cent a ton on the finished product of any one company, whether that company be only a miner or carry its own ore through to steel rails or watchsprings. The State is expected to aid in the coming development by not only removing this tax for a certain period, but by also taking off the 25 cents per ton royalty on ores mined on State lands, on which lands many of the best of the discoveries on the Mesabi have been made.

The unanimous decision of the stockholders of the big Republic Mine on the Marquette range to pull up stakes and transfer operations to the Mesabi is a feather in the cap of the new range that its advocates at Duluth regard as fully as important as the first run of metal made from ore from the Cincinnati Mine. The president of the Republic was on the Mesabi last summer and is understood to have options on several excellent properties, notably in town 58-18, for that company. The Republic is too familiar to readers of *The Iron Age* to need remarks, but part of its assets consist of a fleet of fine lake ships which will be put in the Duluth trade. It will be 1894 before the company do much actual shipping from the Mesabi.

Charles Himrod & Co., pig iron merchants, Room 939 The Rookery, Chicago, have issued their annual chart showing the course of prices of pig iron in Chicago, brought down to the close of 1892. The diagram now covers eleven years, having begun with 1882. The grades of pig iron selected for representation on the chart are Lake Superior charcoal and No. 1 coke foundry. A table is appended showing the stocks of coke and charcoal, pig iron and number of furnaces in and out of blast on January 1 and July 1, 1892, and January 1, 1893. The following remarks are also printed at the bottom of the chart: "One feature of the trade for 1892 is a continued tendency on the part of the consumer to buy from 'hand to mouth.' Fewer long-time contracts are made. The gradual decline in prices for the past few years is doubtless responsible for this condition."

The annual dinner of the Engineers' Society of Western Pennsylvania was given at the Duquesne Club, Pittsburgh, on Thursday night, the 26th ult.

The British Minister at Peking has been admitted to the presence of the Chinese Emperor through "the big gate," showing that the barriers are going down before the advance of Western civilization.

THE WEEK.

Several organizations of machinists East and West are endeavoring to make universal a rule requiring four years' apprenticeship before anybody can be recognized as a competent workman.

Glass manufacturers in Pennsylvania find that they cannot depend on natural gas fuel and are adopting coal. The Findlay field is also said to be exhausted. Crude oil as a substitute is too expensive.

Thirty ships were loaded at San Francisco for New York last year, instead of about a dozen per annum, as heretofore.

Over 500,000 lizard skins were imported from Mexico last year for conversion into card cases, pocket books, purses and such articles.

Twelve leading locomotive works in this country built 1703 locomotives in 1892, against 1968 in 1891. Forty-eight of the principal car factories turned out 93,393 freight cars last year.

Horace Smith, of the firm of Smith & Wesson, in his will leaves for objects of charity one-half of his estate, which is estimated at \$1,000,000.

The import trade of the country is concentrating in New York year by year. In 1891 New York's share of the imports was 62½ per cent.; last year it was 63½ per cent. Exports from New York are in the same proportion for the two years, viz., 44½ per cent. In other words, of the total imports of the country, amounting to \$915,375,377, New York received \$572,613,259, and of \$1,050,892,197 exports New York handled \$377,722,985. In the import trade Boston and Philadelphia are next in importance, and in exports New Orleans and Baltimore are next.

The agent of a Canadian firm interested in an attempt to establish a steamship line to Jamaica has returned after a year's absence in that country. He believes that a successful trade can be built up, both in provisions and manufactures. He concedes, however, that New York and Boston have the advantage in distance and in affording a better market, besides furnishing larger return freights. There are now in the American trade four large lines, and the circumstance is mentioned that four weeks ago 5000 packages were left on the New York dock for lack of ability to carry them. The reasons assigned for the alleged American monopoly is that manufacturers here have gone to the trouble to make goods especially for the Jamaica trade.

The foreign trade of the United Kingdom in 1892 shows very unfavorable changes when placed in comparison with the figures for the previous year. The imports of merchandise show a decrease of \$57,420,325. In the exports of British goods there is also a very large decrease, amounting to \$98,181,277, but the re-exports of foreign goods display an increase of \$12,671,524. In the total values handled there is a reduction of no less than \$142,930,078. The excess of imports of merchandise has risen to \$644,478,061, an increase of \$28,089,428.

Governor-General Stanley of Canada, in opening Parliament, stated that the completion of the canal works at Sault Ste. Marie is being hastened to make Canadian commerce independent of any other route.

Five lighthouses on the coast were destroyed in the recent storms, and the damage to lights and buoys is estimated at \$1,000,000.

In the Hawaiian Islands there are 40,000 contract laborers who could not be "annexed" to the United States under existing laws.

A statement of the commerce of the Argentine Republic for the year 1892, furnished by the consul in New York, shows that the exports thence amounted to \$5,278,240 and the imports by direct trade were \$4,819,600. Exports from New York comprised upward of \$2,000,000 in agricultural machinery and implements, and something like \$200,000 in hardware miscellanies, \$10,000 in firearms, &c.

For the six months ended on December 31 the total exports of the Dominion were \$74,258,707, an increase of \$2,520,658. For the same period the imports were \$60,272,922, an increase of \$3,688,604, showing a total increase in trade of \$6,209,262.

The Hebrew Technical Institute in Stuyvesant street, New York, seeks to aid young men who have an aptitude for mechanics. Last year the average attendance was 138 and 32 graduated, of whom 75 per cent. obtained desirable positions.

What is known as the Arnot case, on trial at Williamsport, Pa., to test the legality of the Reading combine was decided by the Lycoming County court in favor of the defendants. It will be appealed.

The Broadway Improvement Company will put up a fire-proof sky scraper near Fourteenth street for \$600,000. The walls will have an iron and steel frame, which may be said to be the fashion in buildings of this description.

The College of the City of New York proposes to erect a new building which will cost not less than \$575,000.

President Howell says he expects before long that electricity will take the place of the cable on the bridge railroad.

The Commissioner of Navigation estimates that about \$200,000,000 a year is now being paid by Americans to the owners of foreign marine tonnage.

The Boston Heating Company have just realized 10 per cent. on their stock, being the first and the last dividend to be derived from their investment.

Statistics of the coal trade published in Philadelphia show a wonderful increase in the production of anthracite and bituminous coal in this country of late years. Here is a summary:

	—Short tons—	
	Anthracite.	Bituminous.
1880.....	28,649,812	42,831,758
1890.....	45,600,487	95,629,026
1891.....	49,500,000	100,000,000
1892.....	52,000,000	110,000,000

Cotton planters are preparing for another convention, to be held next spring, to restrict production.

Naval officers strenuously oppose the introduction of cellulose on ships of war to prevent the ingress of water following the penetration of a missile, on the ground that it harbors vermin and would deteriorate in the tropics. It is suggested that the spaces for it would be filled at the navy yard when the ship is preparing for action.

It is not disputed that New York is a growing city. In the building line there were upward of 100 plans filed at the Building Department each of which involved an expenditure of \$100,000 or over; there were three where the expenditure was \$700,000, and in 14 instances the amount was not less than \$300,000. Lofty dwellings and flats were a leading feature. The total cost of new buildings projected in 1892 was \$59,000,000 as compared with \$56,000,000 the year before, and the number of buildings was nearly 3000, a moderate increase over 1891. Among structures completed the Have-

meyer building, fifteen stories high, is the giant. Among those who have engaged suites for terms of years in the latter are the Consolidated Wire Works Company, the National Tube Works Company, the Delamater Iron Works and the Westinghouse Air Brake Company.

The population of Canada in round numbers is 5,000,000 souls. The most accurate returns available are those furnished by the census of 1891. The table which follows shows the population in each province during the decennial periods from 1871:

Provinces.	1871.	1881.	1891.
Ontario.....	1,620,581	1,923,328	2,114,321
Quebec.....	1,181,516	1,350,027	1,496,535
Nova Scotia.....	387,800	440,572	450,396
New Brunswick.....	235,584	321,733	321,263
Manitoba.....	18,995	62,200	152,506
British Columbia.....	36,427	49,459	97,613
Prince Edward Island.....	94,021	108,891	108,078
Northwest Territory's.....		56,446	98,967

Totals..... 3,635,024 4,324,810 4,832,879

This table exhibits a gross gain in entire Canada for ten years of 507,869 people. Of this increase over 160,000 is credited to four cities—Montreal, Toronto, Hamilton and Ottawa.

Representative Harter of Ohio has offered a bill which provides that in case any monopoly or trust exists, contrary to the public interest, and it is found by the Secretary of the Treasury upon investigation that such monopoly or combination to maintain artificial prices is aided by any duty imposed upon foreign imports, or by any patent granted by the United States, it shall be within the power of the Secretary to abolish such a duty on imports or such a patent.

The ice blockade in Long Island Sound and in the coal ports adjacent to New York threw an enormous traffic over the Poughkeepsie bridge.

A bill in the Pennsylvania legislature provides for a manual training school for indigent children.

The entire baggage, transfer and coach system along the line of the Central Railroad from New York to Niagara Falls has been purchased by a syndicate with a capital stock of \$1,500,000.

A strike at the Brooks Locomotive Works in Dunkirk has become so serious that a regiment of troops was called for to protect the men who remain inside the works. The riveters in the boiler department refused to work under the contractors, alleging inhuman treatment.

No less than twelve thousand traction engines, it is stated, are at present in use in England for hauling heavy freight, or for passenger service, or for steam plowing, or as road rollers, and are built as a rule in one of three sizes. The smallest is an engine weighing nine tons when fully equipped and has cylinders 8 x 10 inches in size.

The official report of the Mexican Secretary of the Treasury, giving the exportations from that country for the past fiscal year, has just been issued. It shows that the total value of the exports through the 40 custom houses of Mexico was \$75,467,700. Of these exportations the precious metals reached the total value of \$50,000,000. The exports of precious metals exceeded those of the preceding fiscal year by \$13,000,000, while those of miscellaneous productions fell off \$700,000. The exports were distributed among foreign nations as follows: Germany, \$4,434,231; Belgium, \$340,659; Colombia, \$31,048; Costa Rica, \$1050; Spain, \$661,849; United States, \$49,392,664; France, \$4,644,385; Guatemala, \$143,740; Holland, \$49,997; Honduras, \$4400; England, \$15,267,455; Italy, \$4732; Nicaragua, \$10,914; Russia, \$26,200; San Salvador, \$3519; Venezuela, \$3250. The exports to the United States aggregated \$4,949,588 more than in the preceding fiscal year.

The Iron Age

New York, Thursday, February 2, 1893.

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CHAS. KIRCHHOFF, - - - EDITOR.
GEO. W. COPE, - - - ASSOCIATE EDITOR, CHICAGO.
RICHARD R. WILLIAMS, - - - HARDWARE EDITOR.
JOHN S. KING, - - - BUSINESS MANAGER.

Pig Iron in the Northwest.

The recently published statistics of the American Iron and Steel Association give much satisfaction to those interested in the Northwestern iron trade. The fact developed from month to month during the last year, as our blast furnace reports were published, that Illinois was taking higher rank among the pig-iron producing States than ever before, but of course the full significance of its upward movement could not be realized until totals were obtained at the close of the year. It now appears that Illinois was the banner State in the Union last year in increasing its output of pig iron, whether tonnage of increase or percentage of gain is made the basis of comparison. Its production in 1892 was 949,459 gross tons, against 669,202 tons in 1891, being a gain of 280,248 tons, or about 42 per cent. It is true that in 1891 there had been some falling off as compared with 1890, which was the year of largest output up to that time, but the reduction was less than 33,000 tons. The advance made in 1892 was therefore an immense stride forward and not merely the recovery of lost ground.

Grouping the States of Michigan, Wisconsin, Illinois and Minnesota, it is found that the entire Northwest produced last year 1,322,903 tons, against 1,080,733 tons in 1891, an increase of 242,170 tons, or over 22 per cent. The gain in Illinois was to some extent offset by a reduced output of charcoal pig iron in both Michigan and Wisconsin and of coke pig iron in Wisconsin. Michigan continues to produce charcoal iron exclusively. Minnesota increased its output of pig iron, making coke iron exclusively. Examining the records of preceding years, it will be found that the Northwest has increased its production of pig iron at a more rapid rate than the increase in the country at large. In 1880, when Michigan was a larger producer of pig iron than Illinois, the entire Northwestern group made a trifle over one-twelfth the pig iron turned out by the United States. In 1885 the quantity produced was one-tenth of the whole. In 1890 an advance was made to one-eighth, and in 1892 to one-seventh. That the Northwest has not heavily exceeded its local requirements in increasing its production would seem to be borne out by the association's statement of stocks of unsold pig iron, which were less than a two weeks' supply, taking all grades into consideration.

We make no invidious comparison with other sections of the country in agreeing

with our Northwestern friends that the future will find them taking a still more prominent place in the iron trade. The excellent showing made by the Northwest last year was due, in large part, to the tremendous increase recently made in the blast furnace capacity of the Illinois Steel Company. Furnaces operated by other companies, with few exceptions, did not sustain the records which they had made in previous years. This is true of coke furnaces as well as of charcoal. Now, however, the indications point to a more active year on the part of the smaller companies, which promises to considerably advance the output of 1893 over that attained in 1892. Charcoal furnaces which were idle last year are making preparations to resume operations. A new charcoal furnace in Wisconsin will be blown in at an early day, and another which consumed the greater part of the year in removing to a new location will be making pig iron in the spring under greatly improved auspices. Coke furnaces are also blowing which were idle a year since, and other idle ones will resume operations as soon as they can obtain a supply of ore in the spring, unless perchance prices are meanwhile forced down to a point of absolute loss to the makers.

The very low level which pig iron prices have recently struck does not wholly check projects for further expansion of the Northwestern pig iron industry. It is altogether likely that in the near future additional blast furnaces will be built at or near Chicago, for which plans have already been made. There are intimations also that operations of some magnitude are to be carried through at the head of Lake Superior. A new charcoal furnace is to be built at Ironwood, Mich. The increased output of pig iron in the Northwest will, therefore, not depend solely on the operation of existing plants to their full capacity, but will be reinforced by fresh enterprises, promising continued steady growth.

The Rights of Labor.

The labor troubles of the past year have probably excited more discussion of the relations between capital and labor than any previous occurrences of the kind. So much has been printed upon this subject that one would imagine the public thoroughly wearied and ready to say to employers and wage-earners "a plague o' both your houses." But this is not the case. The matter is of too important a nature to be dismissed. Until some effective plan is evolved for settling labor disputes men will continue to discuss the relations of capital and labor and to propound their theories upon the question of the rights of both parties. It is interesting to note that a change has taken place in the manner in which the rights of workingmen are regarded. The Homestead trouble was the occasion of a sudden outburst of rampant socialism from unexpected sources. For a time it seemed that the weight of public opinion was being exerted more and more strongly against individual prop-

erty interests and in favor of the recognition of some sort of a right in mankind to other people's property. This doctrine was so manifestly absurd that public opinion soon corrected itself, and of late there has been a decided tendency among public speakers and writers to take the anti-socialistic side of the discussion.

One of the most forcible, logical and thoroughly sensible contributions to this discussion is an address recently made before the Sunset Club by Z. S. Holbrook of Chicago and now issued in pamphlet form. Mr. Holbrook sets forth the circumstances surrounding the outbreak at Homestead in a calm, dispassionate manner, perfectly free from prejudice and then proceeds to define the rights of the company and their workmen without regard to any other considerations than those of natural rights as laid down by accepted authorities. He denounces demagogism as the underlying cause of the latter-day mystification of the true relations of employers and employed. With caustic irony he thus sets forth the demagogic view:

Capital is denounced as a criminal acquisition. The successful merchant or manufacturer is the real criminal of to-day. The way to heaven is by the poorhouse. The hero is the tramp. Poverty has become a virtue. Muscular labor and not brain labor is the highest goal of manhood, and all such talk because the men who use their muscles cast a larger number of votes than those who use their brains.

He says wealth is not created by labor alone, and with almost brutal frankness adds that the province of labor is simply to change the form of matter; it is the province of capital to pay labor its wages for so doing, and then assume the risk and responsibility of changing the place and time of matter. "When wages have been paid all obligations of capital cease, except such as pertain to the domain of private conscience." Following up his course of reasoning to its logical result, it would be difficult to find a stronger representation of the whole question of labor's rights than the following concise summary, with which he concludes:

1. Work is a blessing, not a curse.
2. The greatest philanthropist is he who furnishes employment to others.
3. Aggregations of capital are beneficial to society, as they reduce the cost of production.
4. Capital and labor are partners, but capitalists and laborers are not.
5. Labor must choose between the certainty of wages and the vicissitudes and risks of profit and loss.
6. Having chosen wages as its part, when wages are paid the obligations of capital cease, except such as pertain to the domain of private conscience.
7. The obligations of capital to share profits with labor are no greater than those of others to share their surplus with the needy.
8. No man can show authority for dictating to capital its duty to labor when agreed wages have been paid.
9. Honesty, industry and thrift are the basic elements of wealth.
10. The capitalists of to-day were the wage-earners of yesterday, and the laborer of to-day can become the capitalist of to-morrow.
11. The mounds of property are dissipated by the sure laws of nature; hence the State does not need to assist in the work.
12. It is not a crime to acquire and to own. It may be a crime not to do so if one has the ability. Acquiring must not be confounded with avarice.

Finally, man has an inherent and inalienable right to labor, and this right must not be interfered with by unions or strikers. It is not the business of government to aid in the acquisition of money or to make property, but to protect every man, the humblest and the wealthiest, in his lawful efforts to acquire and enjoy the fruits of his labor.

The Outflow of Gold.

The coincident loss of gold by shipments abroad and the prevalent distrust of the stability of the currency, arising from an excessive accumulation of silver, is a financial phenomenon that cannot escape the attention even of ordinary observers. Statistics of exports and imports year after year show a balance in favor of this country, on merchandise account, and still the exportation of precious metal goes on. The fact is noticed, furthermore, that each material advance in the market value of securities is attended with a new endeavor to realize by cash sales. No sooner are the market conditions favorable than foreign holders of American securities have pressed them for sale. This process has resulted in the transfer of large amounts of gold to the banks in Europe, whose stock has been correspondingly increased.

When it is considered that the aggregate of foreign investments in the United States, according to intelligent computation, is not less than \$1,000,000,000, and that no small part of this enormous amount is in negotiable securities, no surprise need be felt if distrust of the financial future should incite a disposition to sell, especially if the situation abroad, by reason of financial pressure, also suggests the expediency of realizing upon foreign investments. Not to speak of the possibility of political disturbances on the European Continent at no distant day—which many apprehend—the fact is well understood that Austria not long ago completed negotiations for a large gold loan, partly to strengthen the resources of the national treasury. Russia, too, is in a position to draw at pleasure for large amounts standing to her credit.

The circumstances above enumerated need possess no special significance, were it not for the reduced supplies of gold in the United States Treasury. This fact, together with the depreciation of silver, which last month dropped in London to the lowest quotation ever made in that market, imparts to every considerable gold movement unwonted importance. A mountain of silver, however large, cannot uphold a superstructure of paper circulation payable in a different kind of metal.

The Reform of the Drawback System.

Manufacturers who are active in the export trade have a grievance which should be removed. In many lines American mills and works import foreign raw material, paying duty on it. Of this duty 99 per cent. is refunded when the market product is exported. To establishments which are located at or near tide-water this drawback system is a great aid in securing an entry into foreign mar-

kets, and in holding trade so captured. Anything which hampers or defeats this movement is hurtful to the progress of American goods in neutral markets. We know of instances in which American manufacturers were forced to give up the advantages which might accrue to them because they were not in a position to keep large sums of money locked up in the hands of the Treasury. It is a fact that the United States has kept in its possession duties subject to drawback for nearly a whole year before the red tape had been laboriously and slowly reeled off. In addition to this vexatious delay the business is hampered by the restrictions due to the identity clauses, it being demanded that the manufacturer send out the identical material which he has imported. Unless the export operations are on a large scale, which is rarely the case, the embarrassments to which we refer are such that the whole system is abandoned.

By way of illustration we may give some figures which show what advantages may be attained under the drawback system. Let it be assumed that a wire mill has export orders for say 1000 tons of nails or wire, and imports the equivalent quantity, say 1100 tons, of soft steel billets. With the duty at \$8.96 per ton these billets could be laid down at a mill some distance in the interior at \$29.25. The duty would amount to \$9856. Taking into account the drawback, the cost for foreign billets for 1000 tons of export wire would be \$22,561.56 and adding weighing and other charges, say \$23,500. The purchase of domestic billets would involve at \$24.25 cost, delivered, an outlay of \$26,675, so that the manufacturer would effect a saving by availing himself of the drawback system of \$3175. In spite of so tempting a difference, with the aid it would give in taking foreign business, the purchases of foreign billets were not made, and that solely on the ground that the embarrassments connected with the drawback system outbalanced the advantage.

The whole trouble could be avoided if the identity features were abandoned. If a manufacturer could ship product made of raw material of like grade, whatever its source of production might be, manufacturers could ship promptly and would be relieved of all the bother involved in keeping foreign and domestic stock strictly separate throughout the whole process of manufacture, the whole system of returning duties collected would be greatly expedited and a strong impulse would be given to the American export trade.

The Pottsville Steel & Iron Company, which, running full, employs 1200 hands in its furnaces, rolling mills and bridge works at Pottsville, Pa., is about inaugurating a novel system of employees' insurance. For temporary disablement, one-half of weekly wages will be paid, limited to 50 weeks; loss of an eye, hand or foot, expenses and one-fourth of a year's wages; both eyes, &c., half of a year's wages; death within three months, expenses and a year's wages—no indemnity to exceed \$1500. Riots, strikes, &c., dissolve the insurance. Policyholders must pay 1

cent on each \$1 earned. No refunding will be made in the event of discharge or voluntary retirement from the company.

The Barney & Smith Car Company.

The Governing Committee of the New York Stock Exchange has recommended that the following securities of the Barney & Smith Car Company be listed on the exchange: One million dollars first mortgage 6 per cent. gold bonds of 1942, Nos. 1 to 1000 inclusive, the \$2,500,000 8 per cent. cumulative preferred stock and the \$1,000,000 common stock. Both classes of stock have the same voting power, both are full paid and unassessable. The company were incorporated May 31, 1892, taking over the property and assets of the Barney & Smith Mfg. Company, established in 1849. The property covers 28 acres of ground, all of which is owned by the company. The buildings are 40 in number. The company employ 1750 men. The profits of the company for six years and one month, ending July 31, 1891, were \$2,321,163, or a yearly average of \$381,561.

The following is a statement of the assets and liabilities of the company as of December 1, 1892, and is so arranged as to show the profits which have accrued since July 31, 1891:

Assets.

Plant, &c., of the Barney & Smith Mfg. Company as on August 1, 1891.....	\$3,472,594
December 1, 1892.	
Additions to plant since July 31, 1891.....	26,454
Stock and materials on hand and cars completed and in process of construction.....	937,553
Cash on deposit and in hand.....	24,899
Bills receivable.....	318,703
Cars leased.....	19,002
Bonds.....	20,000
Accounts receivable.....	602,969
	\$5,422,178

Liabilities, December 1, 1892.

Capital stock, preferred.....	\$2,500,000
Capital stock, common.....	1,000,000
First mortgage bonds.....	1,000,000
Bills payable.....	23,000
Due depositors in savings fund (employees).....	31,576
Due salaries and pay rolls to December 1.....	60,963
Accounts payable.....	531,947
Assets in excess of liabilities, representing earnings 16 months to date.....	\$524,691
Less dividend of December 31, 1891.....	\$150,000
Less dividend 2 per cent. preferred stock, September 1, 1892.....	50,000
Less dividend 2 per cent. preferred stock, December 1, 1892.....	50,000
	250,000
	274,691
	\$5,422,178

The new six story manufacturing building at 62 to 66 South Canal street, Chicago, was damaged by fire on the 28th ult., but the occupants suffered most damage from water. The first floors are occupied by the Perch Mfg. Company, manufacturers of mining machinery, the New York Safety & Steam Gauge Company, dealers in safety valves and steam gauge machinery, and Samuel Lyon, manufacturer of leather belting. The Copeland & Bacon Company, manufacturers of iron supplies of all kinds, occupy the second floor. On the third are the March & Davis Cycle Company and on the fourth floor the Chicago Bamboo Company. Christ. H. Stoefting manufactures metal specialties and electric apparatus on the fifth floor. The Scully-Castle Company occupy a portion of the basement, with an office on the fifth floor of 64.

OBITUARY.

HENRY O. BONNELL.

In the death of Henry O. Bonnell of Youngstown the Mahoning Valley iron trade has lost one of its most conspicuous representatives. Henry O. Bonnell was born on January 11, 1839, at Newlay, Yorkshire, England, and he was the third child of William and Sarah A. Bonnell. William Bonnell and his family removed to the United States in 1841, taking up their residence first in Cincinnati. In 1843 they removed to New Castle and afterward to Pittsburgh. After a few years' residence there, again the family moved to New Castle. Later their residence was taken up in Connellsville, and there they lived until 1850, when for the third time they took up their residence in New Castle.

In 1846 the Youngstown Iron Company, composed of then prominent capitalists of this city, were organized and built a small mill on the "flats" along the old Ohio and Pennsylvania canal. This company operated the mill for a few years, when it was shut down and remained idle until 1855. In the winter of 1854 a company of practical iron workers from New Castle, consisting of Joseph H. Brown, Richard Brown, Thomas Brown and William Bonnell, father of the subject of this sketch, purchased the mill. The plant was but a small affair, having but a total capacity of 7 tons of finished iron and nails per day. The firm of Brown, Bonnell & Co. was organized, and from that date the great prosperity of Youngstown began.

Henry Bonnell came to Youngstown at the same time with his father, and for one term after removing there he attended the public school. He had previously secured a common school education. After one term of school he went into the mill, and soon afterward was promoted to be bookkeeper in the office.

In 1875 William Bonnell died, and in the same year Brown, Bonnell & Co. were incorporated with Henry O. Bonnell as vice-president and W. Scott Bonnell as treasurer. H. O. Bonnell was successively re-elected vice-president until 1879. The little "old" mill in the meantime had been so improved and built up that it had become one of the great manufactories of the country. In 1879 Brown, Bonnell & Co. sold out to another company, but the name was retained. H. O. Bonnell, W. Scott Bonnell, Richard Brown, C. D. Arms and others purchased the Valley Mill plant on Crab Creek and began its operation under the firm name of the Mahoning Valley Iron Company, H. O. Bonnell then being at the head of the company. In 1886 the company were incorporated with H. O. Bonnell as president. This office, which also virtually involved the duties of general manager, has been filled by Mr. Bonnell ever since until the time of his death.

Mr. Bonnell was a careful and conservative business man, and in financial matters he never went far outside of the iron

business for investments. At the time of his death he was president of the Mahoning and Shenango Valley Manufacturers' Association, with which organization he had been prominently identified since its inception; president of the Mahoning National Bank; president of the Hubbard Rolling Mill Company; director in the Ohio Steel Company, the Lakeside Nail Company of Hammond, Ind., and also of the First National Bank.

At a special meeting of the Mahoning and Shenango Iron Manufacturers' Association, the following resolutions were unanimously adopted:

Whereas, Since the last meeting of this association Mr. Henry O. Bonnell, who has been the president of this association since its organization has been removed by death, and

was born there. Seven years ago he suffered a paralytic stroke, but had nearly recovered from its effects when a complication of diseases caused his death. When young he was engaged in the milling business, but of late years and up to the time of his illness was interested in the Rochester Axle Works.

FRANCIS W. TRUMAN.

Francis W. Truman died at Owego, N. Y., January 27, of heart failure. He was born at Candor, N. Y., December 13, 1812. In 1836 he entered the mercantile business with L. Truman & Bros. He was a member of the old firm of Gere, Truman, Platt & Co., which manufactured champion grain drills.

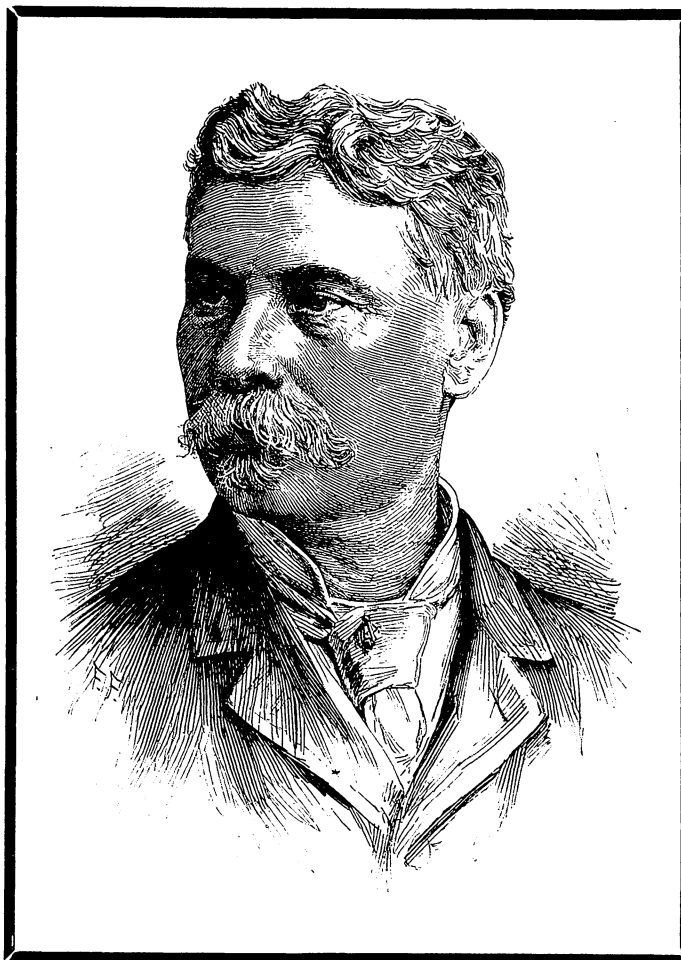
SAMUEL FEWTRELL.

Samuel Fewtrell, an old iron manufacturer and one of Joliet's most prominent citizens, died suddenly at Joliet, Ill., on the 23d ult. He was born in England on April 20, 1837, his father being a miner. At the very early age of nine he began to work in a rolling mill and in the course of time, by industry, application and natural qualities of leadership, he rose to fill responsible positions. In 1871 he removed to America, finding employment first in Elmira, N. Y., whence he removed in 1873 to Joliet, working for a time as helping heater. In 1874 he went to California, where he remained a year. Retracing his steps eastward, he was next engaged in the Tudor Iron Works at East St. Louis, returned for a brief time to Joliet, and in 1877 assisted in starting the rolling mill at Pueblo, Col. After this experience he again entered the works at Joliet and for over ten years was superintendent of the rail mill, retiring from that position to start the Joliet Sheet Rolling Mill. Latterly he had not been engaged in active business on account of poor health. By the exercise of frugality and shrewdness in making investments

Mr. Fewtrell had acquired a neat competence.

On Sunday, the 29th ult., a conference was to have been held at Youngstown, Ohio, between officials of the Amalgamated Association of Iron and Steel Workers and of the Finishers' Union of Iron and Steel Workers. Contrary to expectations, the meeting did not take place. It is stated that the officials of the latter organization were very much incensed at a letter written by M. M. Garland, president of the Amalgamated Association, in which that official refused to recognize the Finishers' Union, and would only consent to meet its members as individuals, and not as members of any labor organization. It is the general belief that this action of President Garland will considerably widen the breach already existing between the above two organizations.

Maine savings banks have on deposit \$53,397,000, a gain of \$3,000,000 during the last year.



HENRY O. BONNELL.

Whereas, we desire to express in some enduring form our regard for him as a man and our appreciation of his sterling integrity and business ability, and our sympathy with the members of his family in their great bereavement;

Now, therefore, be it Resolved, that by his death we have been deprived not only of a valued business associate, but of a friend who had endeared himself to us by his many admirable qualities of mind and heart.

That by his death this association loses an officer who was always active and zealous in his work, prompt to advance the interests of this association and the welfare and prosperity of the valleys; the community a public-spirited and progressive citizen, and his friends a generous and beloved companion; and be it further

Resolved, That these resolutions be spread upon the records of this association and a copy thereof sent to his family as a slight token of our sincere sympathy with them in their sorrow.

These resolutions were signed by Joseph G. Butler, Jr., vice-president, and were dated Youngstown, Ohio, January 24, 1893.

EDWARD W. WILLIAMS.

Edward W. Williams died at Rochester, N. Y., January 24, aged 52 years. He

Pittsburgh Freight Rates.

Below we give table showing rates of freight on principal articles of iron and steel manufacture from Pittsburgh and points taking Pittsburgh rates to cities named below. These rates are an advance in many cases over old rates, and went into effect on Wednesday, February 1.

From Pittsburgh and points taking Pittsburgh rates to	Group 1.	Group 2.
	Per ton.	Per ton.
Akron, Ohio	\$1.15	\$1.15
Allegany, N. Y.	1.25	1.25
Alt. n. Pa.	1.25	1.25
Anderson, Ind.	2.00	2.30
Bradford, Pa.	1.25	1.25
Caro, Ill.	3.25	3.55
Canton, Ohio	1.15	1.15
Cattaraugus, N. Y.	1.25	1.25
Chicago, Ill.	2.40	2.75
Cincinnati, Ohio	1.80	2.00
Cleveland, Ohio	1.15	1.15
Columbus, Ohio	1.70	1.80
Corry, Pa.	1.25	1.25
Crawfordsville, Ind.	2.40	2.75
Dayton, Ohio	1.80	2.00
East Burlington, Ill.		
East Clinton, Ill.		
East Dubuque, Ill.		
East Ft. Madison, Ill.	2.75	3.15
East Hannibal, Ill.		
East Keokuk, Ill.		
East Louisiana, Ill.		
East St. Louis, Ill.	2.75	3.15
Evansville, Ind.	2.75	3.00
Fairmount, Ohio	1.80	2.00
Indianapolis, Ind.	2.00	2.30
Jamestown, N. Y.	1.25	1.25
Johnsonburg, Pa.	1.25	1.25
Kent, Ohio	1.15	1.15
Keithsburg, Ill.	2.75	3.15
Lakewood, N. Y.	1.25	1.25
Limestone, N. Y.	1.25	1.25
Louisville, Ky.	2.60	2.95
Manfield, Ohio	1.55	1.55
Muncie, Ind.	2.00	2.30
Newburg, Ohio	1.15	1.15
Oil City, Pa.	1.25	1.25
Olean, N. Y.	1.25	1.25
Quincy, Ill.	2.75	3.15
Ravenna, Ohio	1.15	1.15
Rock Island, Ill.	2.75	3.15
Salamanca, N. Y.	1.25	1.25
Savanna, Ill.	2.75	3.15
Springfield, Ohio	1.80	2.00
Terre Haute, Ind.	2.40	2.75
Union City, Pa.	1.25	1.25
Vincennes, Ind.	2.60	2.95

Rates shown under head of group 1 will apply on pig iron, mill cinder and scale, per gross ton, and on cast-iron pipe, per net ton, in carloads of 12 tons, net or gross and over.

Rates shown under head of group 2 will apply on billets (iron or steel), blooms (iron or steel), borings (iron or steel), chain irons (in coils), crop ends (iron or steel), ingots (iron or steel), muck or puddle bars, old car wheels and axles, old rails, scrap iron, scrap steel, scrap tin, slabs, unfinished (iron or steel), and wire rods (in coils), per gross ton, and on ingot molds per net ton, in carloads of 12 tons, net or gross and over.

The rates on billets, blooms and slabs will apply only on such unfinished material as is intended to be re-rolled, and can be transported in open cars without damage from exposure to weather and which are covered by the following description:

Billets and blooms, the combined measurement of the width of the four sides of each being not less than 15 inches; also billets of less sizes than the above named, provided they are square (not round, flat or oval), the weight of each being not less than 150 pounds.

Slabs, rough and unfinished, the combined measurement of the width of the four sides of each being not less than 15 inches, and each slab to be not less than 1½ inches in thickness.

Shipments to and from the following points take Pittsburgh rates:

Pittsburgh, Pa.; Twenty-third street Station, Pittsburgh, Pa.; Saw Mill Run, Pa.; Chartiers, Pa.; Groveton, Pa.; Montour Junction, Pa.; Coraopolis, Pa.; Homestead, Pa.; Rankin, Pa.; Braddock, Pa.; Bessemer, Pa.; Stoops Ferry, Pa.; Shousetown, Pa.; Shannopin, Pa.; Wood-

lawn, Pa.; Aliquippa, Pa.; Monica, Pa.; McKeesport, Pa.; Boston, Pa.; Greenock, Pa.; Buena Vista, Pa.; Beaver, Pa.; Bridgewater, Pa.; Fallston, Pa.; Beaver Falls, Pa.; Homewood, Pa.; Rock Point, Pa.; Scott Haven, Pa.; West Newton, Pa.; Van Vetter, Pa.; Whitsett, Pa.

The Pittsburgh and Lake Erie Railroad have just issued a new tariff giving rates of freight between Pittsburgh and points taking Pittsburgh rates and principal points of shipment in Mahoning and Shenango valleys as follows:

Between New Castle, Pa., Lowellville, Ohio, Struthers, Ohio, Haselton, Ohio, Youngstown, Ohio, Brier Hill, Ohio, Girard, Ohio, Niles, Ohio, Warren, M. D., Ohio, Leetonia, Ohio, Hubbard, Ohio, Sharon, Pa., Sharpsville, Pa., Shenango, Pa., West Middlesex, Pa., Wheatland, Pa., Greenville, Pa., and points named below.

Woodlawn, Pittsburgh and intermediate points	Spiegeleisen, Ferro-manganese, Muck Bar, Scrap Iron and Steel Billets, Blooms and Skelp. Wire Rods, Ingots, Slabs (unfinished), Nail Plate, Tack Plate, Tin Plate Bars, carloads, 12 gross tons or over, per gross ton. Iron Ingot Molds, carloads, per net ton.	Pig Iron, car loads, 12 gross tons or over, per gross ton.	Mill Cinder and Iron Scale, carloads, 12 gross tons or over, per gross ton.	Articles of Iron and Steel, classified Fifth Class, C. L., Fourth Class, L. C. L., or lower, as per official classification. Per 100 pounds.	
				C. L.	L. C. L.
	\$0.75	\$0.60	\$0.55	5	6½
	.80	.65	.60	..	..
	.75	.60	.55	5	..
	.75	.60	.55	..	..
	.90	.75	.70	6	7
	.90	.75	.70	6	7
	.90	.75	.70	6	7
	.90	.75	.70	6	7
	.90	.75	.70	6	7
	..	.60	..	..	..

In a supplement issued in connection with the above appears the following:

Taking effect February 1, 1893, you will withdraw from list of articles headed spiegeleisen, muck bar, scrap iron, &c., the following: Nail plates, tack plates and tin plate bars. After above date the rates on these three commodities will be as per official classification.

Also, the rates on billets, blooms and slabs will apply only on such unfinished material as is intended to be re-rolled and can be transported in open cars without damage from exposure to weather, and which are covered by the following description:

Billets and blooms, the combined measurement of the width of the four sides of each being not less than 15 inches.

Also, billets in less sizes than the above named, provided they are square (not round, flat or oval), the weight of each being not less than 150 pounds.

Also, slabs, rough and unfinished, the combined measurement of the width of the four sides of each being not less than 15 inches, and each slab to be not less than 1½ inches in thickness.

The Finishers' Iron and Steel Association of Youngstown are trying to arrange a joint meeting with the officials of the Amalgamated Association of Iron and Steel Workers to discuss the questions at issue between the two organizations, but it seems to be a difficult matter. The members of each association have been cutting and slashing each other in the local papers of late, but it is hoped by many that the differences existing will be amicably settled in the immediate future.

A special from Springfield, Ohio, says: "Oliver S. Kelly, ex-mayor and manufacturer of that city, according to the statement of one of his business partners has

sold his patents on the overhead electric trolley system to the General Electric Company of New York.

PERSONAL.

Mr. Andrew Carnegie arrived in Pittsburgh last week and will probably remain in that city for ten days or two weeks. During his visit he is the guest of H. C. Frick, chairman of the Carnegie Steel Company, Limited.

W. H. Burr has been elected professor of civil engineering at Columbia College, New York.

Theodore Voorhees has accepted the post of first vice-president of the Philadelphia & Reading Railroad.

J. E. McDaniels, formerly of the Norton Iron Works, Ashland, Ky., has severed

his connection with that firm and is now connected with Hyatt, Mathews & Co. of Cincinnati, Ohio, as their traveling salesman.

William Metcalf, the well-known Pittsburgh steel manufacturer, has been chosen president of the American Society of Civil Engineers.

John Birkinbine is the new president of the Engineers' Club of Philadelphia.

Clarence H. Wildes of New York, the Central Trust Company of New York, the Solicitors' Loan & Trust Company of Philadelphia, and Hayden, Stone & Co. of Boston are offering for subscription, to close on February 10, \$750,000 of 8 per cent. cumulative preferred stock and \$250,000 of common stock of the United Anthracite Collieries Company of Pennsylvania. This concern has been formed to acquire the Bellmore Colliery at Mount Carmel, Pa., and the Lawrence Colliery, near Mahanoy Plane. The former is rated at 500 tons per day, with improvements contemplated to carry it up to 3000 tons, while the latter has a capacity of 600 tons per day. The officers of the company are as follows: J. Raymond Claghorn, president; Frank T. Patterson, vice-president and treasurer, and William Hill, secretary. The directors include Charles Y. Audenried, Geo. E. Barstow of Providence, J. Maus Schermerhorn of the New York Wire Cloth Company, S. Howard Wilcox of the Peck, Stow & Wilcox Company, H. H. Woodrough and R. L. Woodrough of the National Saw Company. The by-laws of the company provide that the net earnings shall be apportioned as follows: To dividends upon preferred stock, \$60,000; to a sinking fund, \$13,620; to a reserve fund (for two years), \$25,000, and to dividends upon common stock, \$20,000, making a total of \$118,620. Clarence R. Claghorn, mining engineer, estimates the

recoverable tonnage of coal at 80,000,000 to 85,000,000 tons, and the profits at 75 to 90 cents per ton.

CORRESPONDENCE.

The Detrick & Harvey Duplex Planer.

To the Editor: Referring to the Duplex planer illustrated and described in *The Iron Age* of January 12, we beg to submit a few points which were not clearly shown by the article. The drawing sent you did not show the correct manner in which the tops of posts are joined together. Each post is heavy and designed to stand a severe strain when planers are working independently. In addition to this, the posts are joined together at the top by a latticed casing by which great stiffness is secured and which makes the tool stronger than any other type. The beam, which is one piece when tables are working together, is supported across the back by the two braces, which take a footing on back of post, giving a rigidity not found in any other machine. When the planers are working independently the long beam is removed, short beams taking its place, which can be moved up and down entirely independently of each other. Allowance is made for any unequal wear that may occur in the driving mechanism from any cause. The machine can be so arranged that both tables and the feeding of all the heads can be done from either side. Another feature of the machine is that if it is desirable in planing a very heavy piece to have the tool travel instead of the piece, the work may be bolted down on one table, which can easily be secured, and the tool fastened to the other table. These tools are built in two sizes. Size F, 120 inches wide by 72 inches high by any length, and 168 inches wide by 120 high by any length. We have had several inquiries with regard to this tool and from all appearances it is just what is wanted for large work. THE DETRICK & HARVEY MACHINE COMPANY.

BALTIMORE, MD., January 24, 1893.

Washington News.

(From Our Regular Correspondent.)

WASHINGTON, D. C., January 31, 1893.

The Secretary of the Navy is beginning to feel some anxiety in reference to the subject of the new contracts for armor plate. The bids were to be opened on February 7, and although the advertisements have been made public, the specifications upon which the contractors must make their proposals are still unissued.

It was proposed to lay the specifications before the Secretary early to-day, but owing to the hitches incident to certain views entertained by the steel contractors they did not go to the Secretary's office until late in the afternoon.

The representatives of the steel men, who are here, asked for a simplification of the ballistic tests, which they claimed would not materially change the final results, as far as the Government was concerned. The Secretary agreed to hear their suggestions before finally approving of the specifications.

In the retirement of Chief Engineer Towne on leave of absence for two years from the Navy to accept a position in the service of the Cramps, the Department loses certainly the service of one of the ablest marine engine designers not only in the United States, which is saying all that can be said, but in the world. In dealing with the question, however, the Department officials considered it for the best interests of the Government that Mr. Towne's request should be granted, as his

pay under the Government will temporarily cease, more than double the amount being paid him by the Cramps. The Secretary of the Navy has also authorized the assignment of Chief Engineer Kincaid to duty as instructor of higher mathematics and steam engineering at the State College of Pennsylvania near Bellefonte. Mr. Kincaid was cadet engineer at Annapolis in 1876, and assistant engineer in 1882, and in 1887 was on educational duty at the Agricultural College at Hanover, N. H. He is a native of Ohio. Engineer-in-Chief Melville says he is one of the ablest experts in those branches in the navy.

MANUFACTURING.

Iron and Steel.

The Canton Steel Company, of Canton, Ohio, have had under consideration for some time the advisability of removing their plant to Pittsburgh. However, it is announced that if the Board of Trade of Canton can secure for the company suitable grounds for a proposed extension to their plant the works will be retained at Canton. Otherwise they will be removed to Pittsburgh. The Canton Steel Company is an identified interest of the A. French Spring Company, Limited, of Pittsburgh.

The J. Painter & Sons Company, of Pittsburgh, manufacturers of cotton ties and hoop iron, are making some extensive additions to their plant which will very largely increase their output.

The first annual meeting of the Wheeling Steel & Iron Company, which concern own and control the Benwood Iron Works, Belmont Nail Company, Wheeling Iron & Nail Company, and Wheeling Steel Works, was held in Wheeling, W. Va., last week. The concern had been in business only a part of a year since its organization by the consolidation of the above-named firms, and the financial statement up to January 1 revealed a very satisfactory showing. A cash dividend of 2½ per cent. was declared out of the profits since the company have been in operation. The Board of Directors have decided to make some very extensive improvements in the plant of the Wheeling Steel Works, and also in the mills of the Belmont Nail Company and the Wheeling Iron & Nail Company. The old Board of Directors was re-elected without opposition, as follows: C. R. Hubbard, J. D. DuBois, Alonzo Loring, Joseph Bell, Geo. K. Wheat, H. H. Hornbrook, Wm. F. Stifel, J. G. Hoffman, Sr., and E. W. Oglebay.

During the year 1892 the Cleveland Rolling Mill Company of Cleveland, Ohio, and operating three blast furnaces in addition to their other plants at Cleveland, paid more than half as much for fuel as for all the labor of all descriptions represented on the pay rolls of the company. This concern consumed in 1892 441,261 tons of coal and coke, and 10,535,395 gallons of fuel oil, the total cost for fuel being \$1,180,000; the total pay rolls of the firm in the same time being \$2,235,992. The annual meeting of the stockholders of the above named concern was held in Cleveland on the 18th inst., and the following directors for the ensuing year were re-elected: H. B. Payne, William Chisholm, J. W. Wade, G. W. Howe, W. C. Chisholm, Douglass Perkins, Edward S. Page. At a subsequent meeting of the directors the following officers were also re-elected: William Chisholm, president; W. B. Chisholm, vice-president; Edward S. Page, Secretary.

At the annual meeting of the stockholders of the Brier Hill Iron & Coal Company at Youngstown, Ohio, held in that place last week, the following directors were re-elected: George Tod, Henry Tod, H. H. Stambaugh, J. G. Butler, Jr., and John Tod. The directors organized by electing the following officers: George Tod, president; Henry Tod, vice-president; H. H. Stambaugh, secretary and treasurer; J. G. Butler, Jr., general manager.

At a meeting of the stockholders of the Tyler Tube & Pipe Company of Washington, Pa., manufacturers of boiler tubes, held at that place last week, the following directors and officers were elected: President, W. P. Tyler; vice president, Walter Woodman; secretary, Charles S. Stone; treasurer, Hon. W. E. Whitaker, James B. R. Streater.

The Crown Point Iron Company, at Crown Point, N. Y., have started up their furnace.

The blowing in of one of the furnaces of the Watts Steel & Iron Syndicate, Limited, of Middlesborough, Ky., was delayed by the ex-

tremely cold weather until the 26th ult., when the fires were started.

The pipe and guide mill of the Etna Iron Works, at New Castle, Pa., have been destroyed by fire, and the entire plant so badly damaged that it will have to be rebuilt. Owing to the fire plugs being frozen the firemen were unable to render much assistance. The loss is about \$20,000, and is fully covered by insurance. The plant will be rebuilt at once. It was owned by P. L. Kimberly of Sharon and gave employment to about 300 men. We are advised that the firm do not expect to be delayed in filling orders more than three or four weeks.

It is reported that the Lehigh Iron Company of Allentown, Pa., which failed last summer, will be reorganized. Arrangements are now being made to purchase the furnaces from the Second National Bank of Allentown, which bought it in at assignee's sale. The price, it is understood, is \$95,000, and the new company will have a working capital of \$55,000. Five or six weeks will be required in which to get the furnace in condition to go into blast.

According to San Francisco newspapers, H. Woodcroft Hammond, C. E., the representative of 50 or more English and Eastern capitalists, is now on the Pacific Coast with a view to selecting a suitable location for an immense steel plant. The statement is made that half a dozen cities along the coast have each offered a bonus of \$500,000 to secure the works. It is proposed to invest over \$5,000,000 in the plant, which will give daily employment to 1500 men.

It is said that a plan for the reorganization of the Woodstock Iron Company, Anniston, Ala., has been decided upon, by which the concern will be placed upon a solid financial basis and the operation of the plant, now carried on by the receivers, continued.

The National Iron & Steel Company have recently been organized at Newport, Ky., with a capital stock of \$25,000.

The Berlin Iron Bridge Company of East Berlin, Conn., have received the contract for rebuilding the tube mill of Curtis & Co., at Cohoes, N. Y., lately destroyed by fire. The new plant will be fire proof, constructed entirely of iron and brick, no woodwork being used. The building will be 132 feet wide by 131 feet long, with a wing one side 20 feet wide by 74 feet long.

The Wilmington Gray Iron & Galvanizing Company will locate works at Wilmington, Del., for the manufacture of light gray iron castings.

The Boiling Springs Furnace, at Boiling Springs, Pa., has blown in.

The citizens of Cambridge, Ohio, are raising a bonus for a rolling mill by private subscriptions.

Fires have been lighted in the stoves of the West Duluth Furnace Company, at Duluth, Minn. The output of the furnace, which is placed at 125 tons daily, will be consumed by the West Superior Iron & Steel Company.

At the annual meeting of the stockholders of the Lebanon Iron Company, held January 20, a new Board of Directors was elected, consisting of J. M. Shenk, Thomas Evans, Grant Wiedman, Charles W. Few, A. Hess, George D. Risi of Lebanon, and Charles W. Wilhelm of the National Bolt, Nut & Rivet Works of Reading, Pa. The following officers were elected: J. M. Shenk, president; A. Hess, secretary and treasurer; Thomas Evans, superintendent; H. T. Hecht, assistant superintendent. This company manufacture the well-known brand of "Titan" refined bar iron.

Among new corporations in this State are the Corning Iron Works of Corning, Steuben County, to manufacture and sell iron, capital, \$100,000, and directors, William E. Gorton, H. E. Mills and John B. Caryell of Corning.

The new sheet mill of the Lalance & Grosjean Mfg. Company, at Harrisburg, Pa., is ready for operations and will be started up in about a week. All of the machinery of the different departments is in position, and the billet mill is already in operation. The principal product of the works will be sheets for consumption in the company's factory at Woodhaven, L. I.

The report is current that the Aetna Furnace plant at Ironton, Ohio, has been leased by the Wellston Furnace Company of Wellston. The furnace has been idle for a number of years, but arrangements are now under way to repair and put it in blast at an early date.

The Bessemer department of the Columbia Iron & Steel Company, at Uniontown, Pa., has shut down for repairs.

The Denver, Col., *Sun* questions the expediency of establishing another rolling mill at Denver, inasmuch as the works of the Colorado Fuel & Iron Company, at Pueblo, the works of the Trinidad Rolling Mill Company,

at Trinidad, and the plant now being built near Swansea by the Denver Steel Rolling Mill Company, are quite competent to take care of the present local market and have to meet keen Eastern competition.

The Alice Furnace at Sharpsville, Pa., operated by Pickands, Mather & Co., and Wheeler Furnace Company, is now ready to start up as soon as the coke supply can be secured. The Alice has a capacity of 100 to 125 tons daily. The company's two furnaces at West Middlesex—the Ella and Fannie furnaces—are still out, and will likely remain so until the pig iron business improves.

The fire at Etna Mill, owned by P. L. Kimberly & Co., New Castle, damaged the plant to the extent of \$10,000, which is covered by insurance.

The bar mills of Sharon Iron Company, Sharon, Pa., have resumed operations after a short idleness.

The rolling mill at Zanesville has been started up again after a long shutdown.

Wm. B. Pollock & Co., Youngstown, among a lot of other work, are engaged on a contract for the erection of a hot blast to cost \$40,000, for the Clinton Iron & Steel Company.

The Mahoning Valley Iron Company's nail mill has been started up again after a few weeks' stoppage.

It is reported that the old rolling mill in New Castle, which was destroyed last Saturday night by fire, will be rebuilt. The mill was the oldest in Western Pennsylvania.

The iron market in the valleys is very dull. Many inquiries are being received by manufacturers, but orders are very slow coming in and margin is exceedingly small, especially on pig iron. The general opinion of iron men is that the cause of the lethargic state of the market can be traced to politics. Consumers are wary of overloading for fear that the incoming administration will take action that may greatly affect prices. Nearly all the mills, however, are running at present, but it is on the hand-to-mouth plan.

Several rolling mills in the Shenango Valley and two mills in the Mahoning Valley have about abandoned puddling and steel billets are used instead. It is predicted that the steel billet will be used in three-fourths of the mills here before another year, unless the price of puddling is reduced next July. Some of the manufacturers say they must have \$4 puddling to compete with the new article. The employees, on the other hand, say they will not submit to any such a cut without a long, bitter strike, as they claim that even at the present wages they cannot earn on an average more than \$900 per annum.

The Standard Wire Company of Newcastle, Pa., have been granted a charter of incorporation with a capital stock of \$50,000.

The S. R. Smythe Company, Lewis Block, Pittsburgh, Pa., have recently closed contracts for the complete remodeling to their furnace and fuel gas systems for the Pittsburgh Tube Company, Pittsburgh, Pa.; Oil City Tube Company, Oil City, Pa., six furnaces; Syracuse Tube Company, Syracuse, N. Y., two furnaces; the A. French Spring Company, Pittsburgh, Pa., seven furnaces; Charleroi Plate Glass Company, Charleroi, Pa., additional pot furnaces, kilns and 12 gas producers. Some of these are second and third contracts.

The Midland Steel Company, Muncie, Ind., have entirely been put in successful operation.

Machinery.

At the works of the Westinghouse Air Brake Company, at Wilmerding, Pa., notices were posted last week of a material reduction in wages in several of the departments.

The buildings of the Automatic Boiler Feeder Company, which concern will manufacture the Austin automatic boiler feeder at Marion, Ohio, are 132 x 200 feet, built of brick and stone. The new firm expect to be ready to fill orders for this type of boiler feeder not later than February 15.

Wm. Tod & Co., Youngstown, are building five machines for drawing shafting to the Union Drawn Steel Company, Beaver Falls, Pa. The Tod Company are enlarging their works, erecting a new cupola at their foundry and setting some new machinery in their fitting shop.

There is some prospect that a new safe manufacturing concern may locate at Middletown, Conn., utilizing the plant of the former Stiles & Parker Press Company.

The iron works of the Tower Mfg. Company, at Providence, R. I., have been damaged \$7000 by fire.

The contract for building the Great Northern car shops at Spokane, Wash., has been let for \$80,000. The plant will embrace a foundry

and machine shop, 150 x 160 feet; a round-house containing 20 stalls; a car repair shop, 300 x 90 feet; paint shop, 152 x 55 feet, and a sand and oil house, 100 x 40 feet. The total cost will be about \$140,000.

The Hammond Foundry & Machine Company will erect a plant at Hammond, Ind., consisting of three buildings, 60 x 200, 70 x 100 and 80 x 68 feet, respectively. The company will manufacture bicycles and fine machinery.

The Tynan Machine & Foundry Works, capitalized at \$50,000, have been incorporated to manufacture and deal in all kinds of machinery at Savannah, Ga., and establish foundries, shops, &c.

J. Jacob Shannon & Co., Philadelphia agents for Mundy's hoisting engines, have furnished the Reading Terminal with 16 hoisting engines and 18 derricks, and the Pennsylvania Company with 10 derricks and 7 hoisting engines, besides a large number of rotary dump cars.

The Crowther & Rogers Mfg. Company, capitalized at \$45,000, have filed articles of incorporation at St. Joseph, Mo. The company succeed the firm of Crowther & Rogers, and will do a general brass manufacturing business and furnish plumbers' repairs.

The Robert S. Sloan-Fitzgibbons Boiler Company have been organized and incorporated to manufacture the Fitzgibbons patent boiler, at Oswego, N. Y. A suitable plant will be erected as soon as the weather will permit.

The plant and property of the Bridesburg Machine Works at Bridesburg, Philadelphia, is offered for sale by the Land Title & Trust Company of Philadelphia, assignees for the benefit of the creditors of William E. McGill.

The Wilmington Iron Works, Wilmington, Del., have been damaged by fire to the amount of \$10,000; insured for \$7,500.

Fraser & Chalmers of Chicago are introducing into this country mining pumps and compressors of the Riedler type, of which they have control. The salient feature of these pumps is positive closure of the valves, which is so effected as to obtain the full lift, with increased speed, greater simplicity of construction, smaller number of valves, reduced wear and improved efficiency. These advantages over the usual type of construction are proved by over 300 installations in Europe, in deep mines, city water works (notably in the city of Paris) and for every pumping and compressing service. These pumping engines are to be supplied to the city of Boston, Mass., and Fraser & Chalmers are installing the first Riedler mining pump in the United States for the Boston & Montana Company. This has 5½ inch and 6-inch plungers, 16-inch and 25-inch steam pistons, all 24-inch stroke. Its duty is 900 gallons per minute, lifted 600 feet.

The Goubert Mfg. Company, New York, makers of the Goubert Feed-Water Heater, have purchased the patents, stock and business of the Stratton Separator Company and are now the sole manufacturers of the Stratton Separator.

The Reeves Pulley Company, Columbus, Ind., now have in course of construction a 15-foot wood split pulley to be shipped into Canada. Also a 14-foot pulley for St. Louis, Mo. These two large pulleys, together with four carloads of stock received during the last ten days, throws them greatly behind orders.

The Lloyd Booth Company of Youngstown, Ohio, have received a contract from the Minneapolis Rolling Mill Company of Minneapolis, Minn., for the construction of a 9-inch bar mill and a 12-inch stand of rolls. The Lloyd Booth Company have recently let a contract for the erection of a building 80 x 100 feet, which will be built adjoining their present foundry and will be equipped with two steam cranes, one of 30 tons and the other of 20 tons capacity. It is expected that the new foundry will be completed and ready for operation by March 1, next. The large increase in the business of this concern has made this addition to their plant an absolute necessity.

Miscellaneous.

The dedication of the Whiteley Harvesting Machine Works occurred at Muncie, Ind., on December 30. The management gave a reception and ball at which 1200 people attended. Addresses were made by Mayor Brady of Muncie, Mayor Burnett of Springfield, Ohio, Gov. Ira J. Chase, and William N. Whiteley, President of the Works. Governor Chase touched the button that set in motion more than a mile of machinery.

During 1892 the Hanging Rock Stove Company of Ironton, Ohio, melted 1135 tons of pig iron and turned out 8000 stoves and ranges. The Foster Stove Company at the same place melted 1300 tons of pig iron during the year.

The Sherlock, Elmer & Sherlock Novelty Iron Works of Canton, Ohio, have been succeeded by the Canton Novelty Iron Works, an

incorporated stock company. The capacity of the plant will be increased and the business extended.

Shultz Belting Company, St. Louis, Mo., have just secured an order for a belt which is one of the largest ever turned out by a belt manufacturer. The belt in question is for use in a large concern in Toledo, Ohio, and when finished will be over 100 feet in length and 80 inches wide. To the same parties they have sold one belt 58 inches wide and 100 feet long and another 24 inches wide and 100 feet long.

The fuel gas plant located at Greensburg, Pa., which was recently destroyed by fire, will be replaced by one of twice the capacity of the one destroyed and that is expected to make 2,000,000 cubic feet of gas per day.

The Meyer U. S. Scale Company of Newark N. J., will erect a new factory 100 x 40 feet in size.

It is reported that the Erie Car Works, Limited, at Erie, Pa., have been seized by the sheriff upon executions amounting to \$102,000 in favor of Erie banks. The plant represents an investment of \$500,000, and includes the Martel Furnace at St. Ignace, Mich.

The Walter A. Wood Mowing & Reaping Machine Company of Hoosick Falls, N. Y., have given notice that the works will start up February 1. The orders already booked are very large and indicate a prosperous year for the company.

The plant of the Ohio Falls Car Company at Jeffersonville, Ind., is now kept running night and day in order to keep pace with orders. The employees number 2000 and the number will shortly be increased.

Among recently authorized corporations in Illinois are the following: Detroit Heating Company, at Chicago; capital stock, \$10,000; for the manufacture of boilers, engines and heating apparatus, plumbers' and steam fitters' supplies; incorporators, Frank M. Peters, Frank A. Winslow and John G. Nazro. The Aurora Bicycle Company, at Aurora; capital stock, \$10,000; for the manufacture of bicycles; incorporators, Walter S. Frazier, Jr., Edward S. Frazier and Lincoln B. Frazier. The Buick Hardware Company, at Chicago; capital stock, \$25,000; for dealing in hardware; incorporators, Martin M. Gridley, Luther Ellison and Edward A. Cross. The Boles Company, at Chicago; capital stock, \$6000; for the manufacture of spreaders for road, speed and draft horses; incorporators, E. Duthill, N. A. Throop and George N. Lyman. The New Haven Silver Plate Company, at Chicago; capital stock, \$600,000; for the manufacture of silver and plated ware; incorporators, S. O. Livenson, William M. Northrup and Benjamin V. Beeker. The Bremer Strand Company, at Chicago; capital stock, \$10,000; for the manufacture of dividers, calipers and forging dies, and for manufacturing in wood and metals; incorporators, John Bremer, E. E. Barrett and E. J. Hamel. St. Louis Smoke Preventing Company (operating under S. E. Flint's patents), at East St. Louis; capital stock, \$60,000; for the manufacture of smoke-preventing devices; incorporators, S. E. Flint, W. F. Mills and William Kuehne. The Chicago Steel Spring Company, Chicago; capital stock, \$200,000; incorporators, Douglass C. Gregg, Malcolm Daleowen and Ross C. Hall. Chicago Smokeless Furnace Company, Chicago; capital stock, \$100,000; incorporators, Charles E. Walker, Delos Carskaden and John D. Brinkerhoff. S. K. White Company, at Chicago; capital stock, \$200,000; for the manufacture of machinery; incorporators, E. P. Hatch, R. C. Ritscher and S. K. White. The Illinois Stoker Anti-Clinker Grate Bar Company, at Chicago; capital stock, \$250,000; for the manufacture of grate bars; incorporators, Charles B. Bean, Fred S. Bean and Watson Ryder. The Victor Key-Opening Can & Machinery Company, at Chicago; capital stock, \$1,200,000; for the manufacture of key-opening metal cans and the machinery for making the same; incorporators, Edward Barry, Charles O. Johnson and Louis Spahn. The Mendota Metal Body Carriage Company, at Mendota; capital stock, \$10,000; for the manufacture of metal body vehicles; incorporators, John Schaller, Matthew Wilson, C. Henning, C. W. Russell, H. B. Aldrich and Benjamin Tanner.

The Shultz Belting Company, St. Louis, Mo., report the following sales: To the Union Depot Railway Company, St. Louis, two belts, 54 inches wide, and to the St. Louis & Suburban Railway Company, St. Louis, one belt 72 inches wide and 154 feet long. This latter belt is the third of this width and size which they have sent to this concern.

It is stated that the efforts of the Canton, Ohio, Board of Trade to retain the Canton Steel Roofing Company at that place have been unsuccessful, and that the works will move to some other city, in which connection Pittsburgh is favorably spoken of.

TRADE REPORT.

In many lines the condition of prices in the Iron and Steel trade can hardly be regarded as much short of desperate. For practically all the staple rolling mill products unprecedented prices keep cropping up. It is quite impossible that the tremendous strain can long be endured. We attribute the low range of values to the almost universal determination to lower costs by aiming to secure full employment. This practice has been general enough for a sufficiently long time to convince a goodly percentage of the rolling mills that their salvation does not lie in that direction, and that it is easier to close down to await a more favorable condition of affairs. It is idle to blink at the fact that quite a number of concerns must be losing money. When once the sellers of raw material, the merchants and the banks realize this, the weak concerns will be brought up with a round turn.

The letter of our Duluth correspondent indicates that the output of the Mesabi range this year is not likely to be as great as expected, but that the Vermilion will considerably increase. If this proves to be a correct prognostication, the Lake Ore market may not become so demoralized as has been feared. As we have repeatedly stated, that is the key to the situation.

Meanwhile the struggle in the Pig Iron markets goes on. There are indications in different quarters that an increasing number of Southern producers is accepting the inevitable and that prices are coming down in competitive Northern markets to a lower level. The leading concerns still hold out. Bessemer Pig in Pittsburgh is steadier, but Gray Forge has weakened there.

Steel Billets have weakened East and West, Pittsburgh and Wheeling having offered them at \$21.10 in Eastern territory. The cry of wolf has been heard so often that it is likely to be disregarded now, but there are weighty authorities who insist that such a figure is ruinous and that it cannot long prevail. The Eastern market is feverish.

The most encouraging event of the week has been the placing of 60,000 tons of Rails by the Pennsylvania Railroad, with the probability that additional quantities will be given out before the end of the week. The principal significance of these purchases is that they usually induce widespread buying by other roads. A lively buying movement in Rails might give a great stimulus to the entire trade from Ore to Finished Material.

Some business has been done in Wire Rods in the West, but at low prices, \$29.50 having been shaded in Pittsburgh. There has also been some selling of foreign Rods for the Pacific Coast.

The Plate trade is agitated over the conviction that exceptionally low bids have been put in on the Cramp order for 20,000 tons, a Pittsburgh mill being singled out as the one most desperately eager for the business. There has been some lively work on Plate orders in the Chicago market, whose outlying territory is also being captured by the Superior Mill, as its natural market.

A leading Pittsburgh works is reported to have captured a large amount of elevated work in Chicago. In the leading Eastern cities the outlook for work is excellent so far as volume is concerned, but competition is exceptionally keen. Beams are weaker at the leading centers. Makers are growing alarmed, and there is some talk of the renewal of former arrangements.

In the Metal trade the only noteworthy features are some sales of Lead and a good line of orders for Light Tin Plates by canners.

Philadelphia.

Office of The Iron Age, 220 South Fourth St., PHILADELPHIA, Pa., January 31, 1893.

Strict adherence to facts will not permit a very glowing report of the condition of the Iron and Steel trades. Only a few days ago there appeared to be a good prospect for improvement, and, while there is no special change as regards consumption, very decided and most unexpected irregularity in prices has been developed. It is difficult to give any satisfactory reason for the change of sentiment, but it is no doubt due to a variety of influences. The most prominent is probably the weakness in Steel in the leading Western markets, which, with a very unsatisfactory outlook in the Ore trade, precludes much hope of any immediate improvement, either in Bessemer Pig or its products. Add to this the low figures at which it is said the Cramps have had named to them for the 20,000 tons of Plates, which are to be closed this week, and some idea can be had of the semi-demoralization which appears to have been sprung on the trade almost within the past 48 hours. The announcement of the financial difficulty of the Pottstown Iron Company is another discouraging feature, and for the time being is likely to add to the gloom and disappointment, and will dampen the ardor of those who were beginning to think they saw better times ahead of them.

Pig Iron.—The latter part of the last week in January was marked by dullness, and, while standard brands held their prices, other descriptions developed an unusual degree of irregularity. Buyers had been groping around for large lots at 50¢ to 75¢ less than quoted rates, and, while some Irons were picked up at extremely low figures, the effect is not likely to be of much importance on the general market. The more favorite brands hold their prices, but a feeling of uncertainty and distrust has been generated by recent events which will require some time to dissipate. Whether some of these transactions were for financial reasons or because of the Ore situation is not known, but whatever the cause the effect has been to unsettle the market and to cause general indisposition to buy anything that is not actually wanted. A very large business was done during January, covering almost all grades of Iron, and it may be said at all sorts of prices, and while the immediate outlook is not altogether satisfactory it is still possible that the shaking up of the past few days may clear the atmosphere and ultimately lead to a better market. At present, however, there is more or less distrust, so that while we quote prices nominally about the same as last week it is quite possible that in spots opportunities may occur for picking up Iron at lower figures than are warranted by general quotations, which for Philadelphia and vicinity are about as follows, and from 20¢ to 30¢ less for Harrisburg, Baltimore and intermediate points:

American Scotch, No. 1X.....	\$17.00	@	\$17.25
American Scotch, No. 2X.....	16.00	@	16.25
Standard Penna. (Lake Ore), No. 1X.....	14.75	@	15.25
Standard Penna. (Lake Ore), No. 2X.....	14.25	@	14.50
Standard Virginia, No. 1X.....	14.75	@	15.00
Standard Virginia, No. 2X.....	14.00	@	14.25
Virginia and Southern, No. 1X.....	14.00	@	14.50
Soft.....	13.25	@	13.50
2X. Soft.....	13.00	@	13.25
Standard Penna. and Virginia Forge.....	12.50	@	12.75
Ordinary Forge.....			

Bessemer and Low Phosphorus Iron.—The weak and declining tendency in Western markets is reflected in a similar condition of affairs in this vicinity. Prices are nominally \$15.50 @ \$17.50 at furnace, but no business of any amount has been done at these prices recently, and on bids for large lots it is not improbable that de-

liveries would be made in consumers' yards at very close to \$15.25 for Western Bessemer and \$16 for Eastern standard.

Steel Billets.—A considerable business has been done during the past few days, and while it is believed that very close to \$23.50 has been accepted for Schuylkill Valley deliveries, open quotations are not less than \$23.75 for Western Billets. Eastern mills quote \$24 and upward, and are placing a good proportion of their product in small lots at materially better figures than are ordinarily quoted, as this class of consumers find it more convenient to order what they want and as they want, rather than to pile up sizes that may be wanted or may not. Under these conditions quotations vary from \$23.50 to \$24.50, the feeling still being feverish and unsettled with nothing in sight to promise any immediate improvement.

Muck Bars.—No demand whatever. Holders quote from \$23 to \$23.50 at mills, but no transactions have been reported for some time past.

Bars.—Improvement comes very slowly, and as yet there is nothing likely to change the current of affairs. Prices are 1.65¢ @ 1.70¢ for city deliveries for Best Refined Bars, but at interior points 1.6¢ (and less) is about all that buyers are asked to pay for good-sized lots. The feeling is not hopeful, and for the next few weeks it is expected that business will be taken at the lowest figures ever known.

Skelp.—A large amount of business has been offered recently, but at prices which, as a rule, sellers found it impossible to accept. Some lots were taken at 1.55¢, delivered, and 1.50¢ appears to have been thought worth considering for a large lot, although it is not known that business was accepted on that basis.

Plates.—It is difficult to define the Plate situation. In some respects business is better, in others the outlook is very gloomy. A large amount of business has been secured from the smaller class of consumers and at fairly satisfactory prices, but for large orders competition is something unprecedented. The orders for the material for the Government cruisers were expected to be at low prices, considering the stringency of the requirements, but the bids for the 20,000 tons for the Atlantic liners are understood to be still more extraordinary. The contracts were to have been awarded on Saturday, and while they may be announced at any moment, it is hardly expected that anything will be done before Thursday. But enough is known already to satisfy the bidders that whoever gets the contract will have hard work to get a new dollar for an old one. Pittsburgh carried off the order last week, and another firm in that city is said to be determined to get their work in on this occasion. Of course nothing definite is known in regard to figures, but it is believed that they have been fixed so as to practically make it a sure thing for the firm in question. The effect on the general market will not be as favorable as was hoped would result from the distribution of so large an amount of business, but as the exact figures will probably not be known outside of the parties directly interested, it may not have much influence on general quotations, which for the present are nominally as follows:

	Iron.		Steel.
Tank Plates.....	1.80 @ 1.90¢	1.85	@ 1.90¢
Shell.....		2.10	@ 2.20¢
Flange.....	2.70 @ 2.90¢	2.40	@ 2.50¢
Fire Box.....	3.00 @ 4.00¢	2.60	@ 2.70¢
Special qualities.....		3.25	@ 3.75¢

The announcement this morning of a receivership for the Pottstown Iron Company has been a complete surprise to the trade. It was an open secret that the new Steel plant had been a costly affair, but it

was supposed that the difficulties encountered in the experimental stages had been overcome and that the plant was, and it probably is, in first class condition to meet any reasonable demands that may be made upon it. The impairment of capital, however, appears to have been serious, and the course adopted is doubtless for the best interests of all concerned. The Pottstown Iron Company have always been known as a progressive as well as an aggressive concern, and in this, their time of difficulty, nothing but kind words are heard. The officers of the company are known to have made prodigious efforts to achieve success, and if they have failed in their efforts to attain that end it is not because of negligence or lack of business ability.

Structural Material.—There is no particular change from last week. Mills are busy and with a moderate amount of new business coming in from day to day, there is no reason to expect anything but continued activity. Prices remain at a low point, however, and in this respect there is no immediate prospect of improvement. General quotations for lots delivered are about as follows: Beams, Channels or Tees, 2¢ @ 2.20¢, according to size of order; Angles, 1.85¢ @ 1.95¢; Universal Plates, 1.9¢ @ 1.95¢.

Sheets.—A considerable amount of business is being done at somewhat irregular prices, although makers who are careful of their reputation in regard to quality refuse to meet the low figures quoted by others. On the whole the outlook is quite encouraging, there being plenty of business in sight, the chief cause for complaint being in the matter of prices. Best makes quoted as follows:

Best Refined, Nos. 14 to 20.....2.75¢ @ 2.85¢
Best Refined, Nos. 21 to 24.....2.90¢ @ 3.00¢
Best Refined, Nos. 25 to 26.....3.15¢ @ 3.20¢
Best Refined, No. 27.....3.30¢ @ 3.40¢
Best Refined, No. 28.....3.40¢ @ 3.50¢
Common, $\frac{1}{2}$ ¢ less than the above.

Quotations given as follows are for the best Open-Hearth Steel, ordinary Bessemer being about $\frac{1}{2}$ ¢ lower than are here named:

Best Soft Steel, Nos. 14 to 16.....2½¢ @ 2½¢
Best Soft Steel, Nos. 18 to 20.....3¢ @ 3½¢
Best Soft Steel, Nos. 21 to 24.....3½¢ @ 3½¢
Best Soft Steel, Nos. 25 to 26.....3½¢ @ 3½¢
Best Soft Steel, Nos. 27 to 28.....3½¢ @ 4¢
Best Bloom Sheets, $\frac{1}{2}$ ¢ extra over the above prices.

Best Bloom, Galvanized, discount....70 and 5 %

Old Material.—A fair amount of business is being done and without any decided change in prices. General quotations about as follows: Old Iron Rails, \$18 @ \$19, delivered; Old Street Rails, \$19 @ \$20; Old Steel Rails, \$15 @ \$16; No. 1 Railroad Scrap, \$16 @ \$16.50, Philadelphia, or for deliveries at mills in the interior, \$16 @ \$17, according to distance and quality; \$8 @ \$9 for No. 2 Light; \$11 @ \$12 for Machinery Scrap; \$11 @ \$12 for Wrought Turnings; \$8 for Cast Borings, and nominally \$22 for Old Fish Plates, and \$13 @ \$14 for Old Car Wheels.

Cincinnati.

(By Telegraph.)

Office of *The Iron Age*, Fourth and Main Sts.,
CINCINNATI, February 1, 1893.

The tone of the market has been weaker during the week and in some instances concessions of 25¢ per ton have been made in order to effect sales. There has been a fair volume of business in the aggregate, amounting to 15,000 tons. Although no very large sales have been made, there were liberal sales of Charcoal Car Wheel Iron at previous prices. That Iron, being well under control, is not subject to fluctuation, but Gray Forge has sold for present and short forward delivery on the basis of \$8.50, f.o.b. Birmingham. No. 2 Foundry has been easier to buy at \$9.50, and while there were no sales of No. 3 Foundry, it was offered at \$9. The offerings of all

grades of Foundry Iron are ample for the demand, which, while liberal for short forward delivery, is not large for distant deliveries, for buyers claim that the conditions of the market are not favorable for contracting beyond the first four months of the current year. But there appears to be a liberal melting of Iron by most consumers. Quotations are as follows:

Foundry.

Southern Coke, No. 1.....	\$13.50 @	\$13.75
Southern Coke, No. 2.....	12.25 @	12.50
Southern Coke, No. 3.....	11.75 @	12.00
Ohio Soft Stone Coal, No. 1.....	16.00 @	16.50
Ohio Soft Stone Coal, No. 2.....	15.00 @	15.50
Mahoning and Shenango Valley.....	15.75 @	16.75
Hanging Rock Charcoal, No. 1.....	19.15 @	19.50
Hanging Rock Charcoal, No. 2.....	18.60 @	19.00
Tennessee and Alabama Charcoal, No. 1.....	16.50 @	17.00
Tennessee and Alabama Charcoal, No. 2.....	15.50 @	6.00

Forge.

Gray Forge.....	11.25 @	11.50
Mottled Neutral Coke.....	11.00 @	11.25

Car Wheel and Malleable Irons.

Standard Southern Car Wheel.....	18.75 @	19.00
Lake Superior Car Wheel and Malleable.....	17.75 @	18.00

Chicago.

(By Telegraph.)

Office of *The Iron Age*, 59 Dearborn street,
CHICAGO, February 1, 1893.

Pig Iron.—The month of January, which has just expired, is credited with having been the most active January in the past two or three years. The tonnage booked has been very large, covering a good percentage of the buyers of this vicinity. The past week was characterized by an excellent general demand, although very few orders ran above 500 tons. A good feature of the trade at present is the fact that consumers are urging prompt shipment. Purchases by the smaller class of buyers are more frequent, which indicates that they are well employed. In fact, the foundries in this vicinity are reported as having seldom been in as active a condition in mid-winter as they now are. The consumption of Iron thus keeps up very well, and manufacturers are looking forward to a year of good business. The hand-to-mouth policy pursued by so many consumers has latterly had the effect of giving more steadiness to the trade than was formerly the case when large contracts were being placed for yearly requirements. Prices, however, show no improvement, but on the contrary manifest a drooping tendency. Local Coke is a trifle easier, while Southern Coke now gives indication of a downward movement which will probably bring prices closer to those made on corresponding Northern grades. The small companies are leading the way, while the large concerns are attempting to maintain a firm attitude, but their representatives are inclined to think they will soon see the necessity of giving way. No. 2 Southern Soft has sold here the past week down to \$12.85. Rather a good outlook is reported for Lake Superior Charcoal, so far as orders are concerned. If buyers and sellers can agree on prices there are likely to be some important transactions in Car Wheel and Malleable Iron very shortly. A round lot of Charcoal was sold on the basis of \$17.25, Chicago, but with guaranteed analysis for malleable purposes, which enabled the seller to get a higher price than the current market rates. The Duluth Furnace blew in last Wednesday in good shape, and it is now doing very well, running on three-quarters Mesabi ore. Quotations are as follows, cash, f.o.b. Chicago:

Lake Superior Charcoal.....	\$16.50 @	\$17.00
Local Coke Foundry, No. 1.....	13.50 @	14.00
Local Coke Foundry, No. 2.....	13.00 @	13.50
Local Coke Foundry, No. 3.....	12.75 @	13.00
Local Scotch.....	14.00 @	14.50
Ohio Strong Softeners.....	16.25 @	17.00
Southern Coke, No. 2.....	13.35 @	13.60

Southern Coke, No. 3.....	13.00 @	13.25
Southern, No. 1, Soft.....	13.35 @	13.60
Southern, No. 2, Soft.....	13.00 @	13.25
Southern Gray Forge.....	12.80 @	12.90
Southern Mottled.....	12.60 @	12.75
Tennessee Charcoal, No. 1.....	16.50 @	17.00
Alabama Car Wheel.....	18.35 @	19.35
Coke Bessemer.....	14.00 @	14.50
Hocking Valley, No. 1.....	17.00 @	17.50
Jackson County Silvery.....	17.00 @	17.50

Bars.—The indications now are that the worst of the depression in Bar Iron is over. The mills selling at the lowest prices have either filled up with work or have decided that they must have more money, and the market seems to have settled to about 1.55¢, Chicago, half extras. The principal makers had refused to sell at better than these prices, and now report that buyers have come to their terms. Plenty of inquiries are in the market from all classes of consumers. A wagon company at Moline purchased 1000 tons the past week, dividing the amount between two Illinois mills. Car work also promises to be more abundant than it has been. The outlook is therefore more cheerful, and some of the manufacturers even go so far as to predict higher prices if the demand continues. Soft Steel Bars are selling at 1.65¢ @ 1.75¢, Chicago, with quite a good demand. Prices for small lots from store still range from 1.70¢ to 1.80¢ for Bar Iron and 1.80¢ to 1.90¢ for Soft Steel.

Structural Material.—Beams have weakened considerably, and are now quoted at 2¢ @ 2.25¢, Chicago, according to quantity. The winter trade has pretty well cleaned up the stock of Beams here, the demand for small lots having been continuously good for the past two months. The mills selling in this market are reported to be either well supplied with work for the future or as having excellent prospects for a considerable amount of business, so it is quite likely the present may be the period of lowest prices. Large contracts for new buildings are pending, but there is some doubt as to whether a few of them will not be postponed until next fall or winter, so as not to interfere with street traffic here during the exposition. Building projects outside of the city are expected to be sufficiently numerous to compensate for any falling off locally. The Indiana Steel Company of Indianapolis are now rolling 20-inch Beams, having begun to roll them on January 26. They report having had excellent success in turning out these large sections from the start. Angles and Universal Plates, mill shipment, continue to be quoted at 1.90¢ @ 2¢, Chicago.

Plates.—The local Plate trade has been somewhat startled by the entrance upon the scene of the West Superior Iron & Steel Company, who are now supplying consumers in the territory between Chicago and West Superior with Bessemer Tank Steel of excellent quality at such low prices as to shut out the mills further east. Their sales have even extended into the city of Chicago, where they have captured trade by their ability to make very prompt shipments. C. W. Davenport has taken orders for 700 tons of Plates for the Pacific Coast, to be used in making hydraulic pipe. The contracts were placed with Eastern Pennsylvania mills at, of course, very low prices. He has since received further large inquiries from the same source. Mill agents, however, report the Plate trade unusually quiet. Sales from stock are also light. Quotations on mill shipment, Chicago delivery, are about as follows: Tank Steel, 1.90¢ @ 2¢; Sheet Steel, 2.10¢ @ 2.15¢; Flange Steel, 2.27¢ @ 2.30¢; Ordinary Fire Box, 3.50¢. Store prices continue as follows: No. 10 to 14 Iron or Steel Sheets, 2.35¢ @ 2.60¢; Tank Steel, 2.25¢ @ 2.40¢; Shell, 2.40¢ @ 2.60¢; Flange Steel, 2.70¢ @ 2.90¢. Tubes are quoted at 60 % off, with concessions on desirable orders.

Sheets.—Common Black Sheets are in fair demand, with some season contracts being placed by large consumers. We continue to quote No. 27 Common at 2.85¢ @ 2.90¢ from mill, and Steel Sheets 2.95¢ @ 3¢. The trade in Galvanized Iron is very quiet in the city, but a little better in outside territory. Juniata is quoted at 70 and 10 % for mill shipment, and 70 % in small lots. Cornice Copper Sheets are very scarce, and the price of large lots is steadily improving. Small lots are as yet not affected, but continue to be quoted at 30 % discount.

Merchant Steel.—Business in this branch is lighter than for the previous two or three weeks, but prices are fairly steady at 2¢ @ 2.20¢, Chicago, for Open Hearth Machinery and Spring Steel. Ordinary Tool Steel is unchanged at 6¢ @ 7¢, according to quantity.

Rail and Track Supplies.—Manufacturers of Steel Rails report orders coming in slowly, so that the tonnage thus far entered is considerably under that booked last year at this time. A great deal of business is in sight, however, which will be closed soon, and there is every reason to believe that in a short time sellers will have caught up to their record in 1892. Standard sections are unchanged at \$30 @ \$32, according to quantity, &c.; Iron and Steel Splice Bars have sold at lower prices during the past week, but manufacturers continue quotations at 1.65¢ @ 1.75¢; Track Bolts are unchanged at 2.60¢ @ 2.70¢ for hexagon nuts; Spikes, 2¢ @ 2.05¢.

Old Rails and Wheels.—A large lot of old Iron Rails was sold at \$18.75, Chicago, and another lot brought about \$18.50 in the interior of the State. These transactions have somewhat surprised consumers generally, as they have been looking for a drop in this material. Dealers maintain their firm attitude and appear to be confident of better prices. Old Steel Rails are very quiet, with quotations ranging from \$11.50 for short pieces to \$13 for long lengths. Old Car Wheels are in fair demand with prices firm at \$14.75 @ \$15.

Scrap.—The market is in a very much better shape than it has been, owing to the increased local consumption. A larger movement has taken place during the past week than for a long time previously. A round lot of No. 1 Forge was sold at \$15.50, Chicago, the transaction being regarded as a good test of values. The Scrap trade with the Mahoning Valley is menaced by the action of the Central Traffic Association changing the classification on Scrap Iron, putting it with Finished Iron and Steel instead of Pig Iron, and protests are now being made by dealers against the change, which is to go into effect on February 13. Dealers quote the following selling prices: No. 1 Railroad Forge, \$15.75; Axles, \$20; Horseshoes, \$15.50 @ \$16; Stove Plates, \$8.50 @ \$9; Heavy Cast, \$11.50 @ \$12. Other quotations unchanged.

Metals.—Lake Copper is weak at 12½¢ for carloads. Last week an unfortunate typographical error made our quotation 20½¢, which should have been 12½¢. Casting brands have not sympathized with Lake Copper, but continued good business is reported at 11½¢ for carloads. Spelter appears a little stronger, but is still quoted at from 4.15¢ to 4.20¢ for carload lots of prime Western brands.

F. S. Atherton has just been appointed Western sales agent for the Union Drawn Steel Company and the Hartman Mfg. Company, both of Beaver Falls, Pa. He will handle their product in the entire territory west of the Mississippi River, as well as Wisconsin, Illinois, Louisiana and Memphis, Tenn. The trade had for some time been under the able supervision of T.

D. Ganse, to whom Mr. Atherton succeeds. Mr. Atherton's acquaintance with the business is the result of several years' experience both as salesman and manager for one or both firms. His office will continue to be located at 508 State street, Chicago.

T. S. Casey, sales agent for the Riverside Iron Works of Wheeling; N. B. Lewis, sales agent of the Union Iron & Steel Company of Youngstown, and J. T. Thompson, Western manager of the J. O. McNeil Company of Akron, have removed from the Masonic Temple to Room 445 The Rockery, Chicago.

Cleveland.

CLEVELAND, OHIO, January 30, 1893

Iron Ore.—Some of the Bessemer Ore on the docks has been sold during the past week at \$4 ½ ton, but to obtain this figure it has been necessary to guarantee that the Ore was high in Iron and low in Phosphorus. One of the leading dealers said to day that *The Iron Age's* summary of the condition of the market last week exactly stated the situation. It is given out very earnestly that not a single negotiation regarding prices for 1893 is pending and that nothing will be done before March 1. The Ore men are not in a mood to hasten negotiations and are content to await the changes in the situation in the Pig Iron market before asserting themselves. During the past week the call from the furnaces was for 25,000 tons of Ore, about the same quantity as was sent forward last week. The Ore piles on the docks have been but slightly lowered, although there is some call for non-Bessemer Hematites at \$3 @ \$3.15, and a few sales at these figures are reported. The experiments with the Mesabi Ore are being watched with intense interest and the result is sure to have an important part in fixing prices for next season's Ores.

Pig Iron.—Although the market is not active here, it is given out in Iron circles that no sales of Bessemer Iron have occurred below \$13.50 ½ ton. A few sales very close to that figure are announced. Sales of Gray Forge Iron at \$12.40 are reported. No. 1 Foundry is still clinging to the \$14 mark, with Southern Irons a close favorite at the same figures. The market, as a whole, is perhaps more active than for several weeks past, but sales are scattering and the demand small.

Manufactured Iron.—The market exhibits considerable activity and prices are fairly firm at 1.60¢ for Common Bar. The mills are well supplied with orders.

Old Rails.—The narrow margin of profit possible under the present condition of the market discourages dealers from attempting to go beyond the occasional demand for a limited supply. Old American Rails are quoted at \$20 @ \$20.50, with only scattering sales.

Muck Bars.—A few small sales are reported at \$24.25 @ \$24.50, Cleveland, but the demand is small and no change for the better is looked for at present.

Old Wheels.—Quotations are still announced at \$14 @ \$14.25 with a slightly better demand than for a few weeks past.

Nails.—The market continues dull and Steel Wire Nails have declined to \$1.50 ½ keg in stock. The demand for Cut Nails is very light.

Scrap.—The local market is quiet and only a small amount of business is reported. No. 1 Railroad Wrought is quoted at \$15.50 @ \$15.75 net ton. Wrought Iron Turnings at \$10.50 @ \$11 net ton and Cast Iron Borings at \$7.75 @ \$8 gross ton.

Barb Wire.—Orders are coming in rapidly and all the local mills will undoubtedly

be well engaged for several weeks to come. Galvanized is quoted at \$2.40 and plain Barb Wire at \$2, carload lots.

Sheets.—The demand, especially for special shapes, is said to be excellent. The margin of profit, however, seems to be small and demands are made at figures not easy to concede.

Freight.—A new schedule of rates will soon go into effect, but the changes, if any, from the existing tariff will be small. Present quotations are: Ore, Cleveland to Valley points, 62½¢; Cleveland to Pittsburgh, \$1.25; Pig Iron: Valley points to Cleveland, 60¢ ½ ton; to Pittsburgh, 60¢. Muck Bar, Blooms, Billets, Scrap, Iron and Steel Rails, Old Wheels, &c.: Valley points to Cleveland, 70¢ ½ ton; to Pittsburgh, 75¢ ½ ton; to Boston, \$3.10 ½ ton; to New York, \$2.70 ½ ton; to Philadelphia, \$2.10 ½ ton; to Newark, \$2.50 ½ ton.

St. Louis.

Office of *The Iron Age*,
Bank of Commerce Building,
St. Louis, January 30, 1893.

Pig Iron.—During the past week little or nothing transpired which could be termed interesting. Consumers have adopted a waiting policy, and as furnaces still appear determined to maintain their prices there is no very large business doing. The month just closing has been a severe disappointment to furnacemen, both as regards volume of trade and prices, and at this time it looks as if February will not prove any better unless some radical change shortly takes place. The market certainly is weaker than it was when our last report was written, and unless consumers enter the market very shortly the future of prices will doubtless be downward. Furnaces which sell high-grade Irons still maintain prices, but as they are meeting with concessions every day, it seems only a question of time when they will have to reduce their prices. The improvement which started in last October seems to have exhausted itself, and furnaces are now accepting orders at least 50¢ ½ ton lower than they sold the same Irons in October and early November, and will doubtless have to accept even lower prices unless the situation changes very rapidly. The consumptive demand during the week under review was fairly good, and the week's sales would foot up several thousand tons. For ordinary quantities we quote as follows for cash, f.o.b. cars St. Louis.

Southern Coke, No. 1 Foundry,	\$14.25 @ \$14.50
Southern Coke, No. 2 Foundry,	13.00 @ 13.50
Southern Coke, No. 3 Foundry,	12.50 @ 12.75
Southern Gray Forge,	12.00 @ 12.25
Southern Car Wheel,	18.25 @ 18.75
Lake Superior Car Wheel,	18.00 @ 18.50
Ohio Softeners,	16.25 @ 17.00
Missouri Charcoal, No. 1	
Foundry,	14.25 @ 15.00

Bar Iron.—The demoralization which prevails in some localities has not as yet influenced this market to any great extent. Locally the trade is in good shape, and while mills have not an oversupply of work, they are not yet bare of orders. The spring trade will shortly open up, and an active demand is anticipated. Mills continue to quote 1.60¢, f.o.b. cars, East St. Louis, half extras. Jobbers ask 1.75¢ @ 1.80¢, according to quantity.

Barb Wire.—Increased inquiry is noted in this department, indicating that the country trade are preparing for the spring demand, which promises to be heavy. The month just closing has been extremely gratifying to the makers of Barb Wire, so far as volume of business is concerned, as there has been a steady demand since the beginning of the year. Mills quote \$2.15 for carload lots of Painted to jobbers; Galvanized, \$2.60.

Wire Nails.—The Nail trade continues to be fairly large, but prices are unsettled. We understand that one large Eastern mill who sell heavily in this market have withdrawn their quotations, refusing to sell at the low price at which others were accepting orders. Mills are now quoting \$1.50 @ \$1.55 in carload quantities to jobbers. There is some talk of manufacturers getting together with a view of holding up prices. If such a scheme is in progress the quicker it is promulgated the better for themselves and the trade at large.

Freight Rates.

Pig Iron.	Per ton.
Birmingham, Ala., to St. Louis.....	\$3.25
Chattanooga, Tenn., to St. Louis.....	3.00
Sheffield, Ala., to St. Louis.....	2.80
Barb Wire and Wire Nails.	Per cwt.
Pittsburgh, Pa., to St. Louis.....	22¢
Cleveland, Ohio, to St. Louis.....	18¢
Anderson, Ohio, to St. Louis.....	14¢

(By Telegraph, January 31.)

Pig Lead.—The market has improved considerably since our last report, and while the demand was not heavy, offerings were correspondingly limited, and 3.65¢ was paid for several hundred tons. There is but little Lead offering to-day and the market is 3.65¢ and firm at that figure.

Spelter.—There has been practically no business doing during the past few days except an occasional sale of a carload, which has been accepted at from 4.07¢ to 4.07½¢. Unless there is some early improvement in the price of Ores and an upward tendency in the Iron market, it seems out of the question to look for any enhancement in this metal, although at 4.05¢ the market is quite firm.

Baltimore.

BALTIMORE, January 31, 1893.

This market just now is very quiet, with considerable competition for what business there is. The heavy snow fall and hard freezing (something very unusual in this territory) is partly the cause of the small amount of business in the market, but one or two classes of material showing any activity whatever. The prospect, however, is good, as there is a great deal of business in the South which is only awaiting the coming milder weather before being placed on the market.

Bars.—The market in this line is very weak, with no signs of improvement. Refined Bars from mill are selling at about 1.80¢, while stock orders are going at from 1.90¢ to 2¢.

Merchant Steel.—The cold weather has acted upon this branch of business if possible more than on any other, as the country consumers are unable to handle any great quantities. We quote Machinery Steel at 2.10¢ @ 2.30¢; Tire, 2.10¢ @ 2.25¢; Toe Calk, 2.35¢ @ 2.45¢; Spring, 2.50¢.

Plates.—Some little business has been done in this line, but it is nearly all repair work. Prices are as follows: Shell Steel, 2.20¢; Flange Steel, 2.40¢; Fire-Box Steel, 2.55¢; Marine Steel, 2.55¢; Tank Steel, 1.90¢.

Soft Sheets.—Iron is rapidly going out of use in this line, and little or none is carried in stock here. Steel is selling at about the following prices from dealers' stock: Three-sixteenth, 2.40¢; No. 10, 2.50¢; Nos. 12 and 14, 2.60¢; No. 16, 2.70¢; Nos. 1 and 20, 3.10¢. Galvanized at 70 and 5 % off list for good orders from mill.

Boiler Tubes.—There has been quite a demand for quick shipments of Boiler Tubes, and some of our large jobbers

carry same in good quantities, and get for 3-inch 65 %, while from mill 65 and 5 is given.

Structural Material.—The market in this line is dead. What little that is going is for uncompleted work. Beams, Channels and Tees at 2¢ @ 2.25¢; Angles, 1.95¢ @ 2¢; Universal Plates, 1.90¢ @ 1.95¢, all f.o.b. Baltimore.

Pittsburgh.

Office of *The Iron Age*, Hamilton Building, Pittsburgh, January 31, 1893.

For the week under review we can report a slightly better feeling, due to a considerable increase in inquiries, particularly for Bessemer Steel and Bessemer Pig. In some lines of finished material as well a slight increase in volume of business is noted, with a large amount of business in sight, some of which is expected to be placed within a short time. The railroads will soon be in the market for considerable material of various kinds for the purpose of bettering their equipment and extending their facilities to take care of traffic to the World's Fair, and just as soon as purchases of this nature commence it will undoubtedly benefit the market considerably. As we have before remarked, it is the general opinion that just as soon as buyers commence to anticipate their wants we may look for a firmer tendency in prices, with possibly slight advances in some directions. Prices during the week have shown very little change over the previous week, and persistent attempts on the part of buyers to force prices on Bessemer Pig and Steel below those quoted elsewhere have so far been unsuccessful.

Pig Iron.—During the week attempts on the part of buyers to force the price of Bessemer down to \$13, Pittsburgh, have been unsuccessful, and offers made a week or ten days ago on a basis of \$13.10 and \$13.15 have since been withdrawn, and it is the impression that there would be no little difficulty in placing an order for Bessemer at this time at less than \$13.25, although it might be done under extremely favorable conditions. A good many inquiries are in the market at present, and as buyers and sellers are nearer together in their views of prices than they have been for some time past it is not improbable that considerable Iron will change hands within the next week or ten days. The market on Gray Forge continues extremely dull, and a very limited amount of this kind of Iron is changing hands. While the price continues on a basis of \$12.25, Pittsburgh, it should be noted that several furnaces in the Mahoning Valley are offering to sell at \$11.50 at furnace, which is equal to \$12.10, Pittsburgh. Even this low price has not brought buyers into the market. The extremely low price at which Steel is obtainable has caused many former users of Gray Forge to abandon that material and substitute Steel in its place, and for this reason there is very little prospect of any improvement either in demand or prices for Gray Forge. While we quote Bessemer as low as \$13.15, Pittsburgh, it is somewhat doubtful whether this price would be accepted by furnaces except under extremely favorable conditions. We quote as follows:

Neutral Gray Forge.....	\$12.25 @	cash.
All-Ore Mill.....	12.50 @ 12.75,	"
No. 1 Foundry.....	14.00 @ 14.10,	"
No. 2 Foundry.....	12.00 @ 13.00,	"
Charcoal Foundry No. 1....	19.00 @ 20.00,	"
Charcoal Foundry No. 2....	18.50 @ 19.00,	"
Bessemer Pig	13.15 @ 13.25,	"

One sale of Bessemer involving about 5000 tons is reported on a basis of \$13.15, Pittsburgh, the deliveries being February, March, April and May. Conditions somewhat out of the ordinary were attached to the transaction. We also note a sale of

3000 tons of Bessemer for February and March delivery at \$13.25, Pittsburgh.

Billets.—Within the past week inquiries have been quite numerous from local buyers of Steel, and in addition, three large Wire Nail manufacturers are reported as being in the market for good-sized blocks. As yet, however, very little actual business has been closed, for the reason that makers are not prepared to accept the views of these large buyers as to prices. One large consumer has made offers at \$21, delivered at his works, for Rod Billets, but up to this time the offer has not been accepted, and as far as known the best price yet named by makers was \$21.25 at makers' mill. It is likely that the next week or ten days will witness some very important developments in the Soft Steel trades. As noted elsewhere, freight rates on Billets from Pittsburgh and Wheeling district to Cleveland have been increased from \$1 to \$1.15 ¢ ton, and from Pittsburgh to the Mahoning Valley from 60¢ to 75¢ ¢ ton. These advanced rates are to go into effect on Wednesday, February 1. Pittsburgh makers continue fairly supplied with business, and the same is true of the Wheeling mills with possibly two or three exceptions. In the spring extensive improvements and additions will be made at the Duquesne Steel Works of the Carnegie Steel Company, Limited. The converting capacity will be more than doubled by the erection of three new converters of 12 tons capacity each to take the place of the two 7-ton vessels now in use, and the entire plant will be remodeled on an extensive scale.

Structural Material.—The moderate weather of the past two weeks has had the effect of increasing inquiries to some extent, and considerable business has been booked as a consequence. The outlook for the future, as far as consumption of Structural Material is concerned, is very good, but with the large capacity for production it is extremely doubtful if prices will be much better during the year than at present, although spasmodic advances may come and be maintained for a time. Prices are about as given last week, and we quote as follows for small lots, nearly all business coming in being confined to purchases of that nature: Beams and Channels, 1.90¢ @ 1.95¢, f.o.b. cars Pittsburgh; Angles, 1.70¢ @ 1.75¢; Universal Mill Plates, 1.70¢ @ 1.75¢; Z Bars, 1.90¢ and Tees 2.05¢ @ 2.15¢.

Steel Plates.—Volume of business continues fair, and now that the weather has moderated considerably an increase in orders is expected. Considerable business is in sight for Western shipment, and it is not at all improbable that Pittsburgh will secure a part of this at least. We repeat quotations of last week, as follows: Flange, 2.05¢ @ 2.10¢; best Fire Box, 3.40¢ @ 3.50¢; Tank, 1.70¢ @ 1.75¢; Bridge Plates, 1.90¢; Shell, 1.95¢ @ 2¢.

Ferromanganese.—We note another decline in price of domestic, and we now quote at \$59.50, f.o.b. cars Pittsburgh, and note a sale of 200 tons at that price. It is the impression that foreign Manganese will have very little chance in this market in the future, as makers of domestic will continue to meet prices of foreign or go slightly lower in order to secure the business.

Steel Rails.—A fair amount of business is reported as having been placed since the first of the year, and the Edgar Thomson Mill continues on Rails, with good prospects of running on this class of product for some time to come. Prices are without change, and we continue to quote at \$29, f.o.b. at mill, for standard sections. We are informed that the report that orders for Rails were being

booked on a basis of \$28 @ \$28.50, Pittsburgh, is entirely without foundation, and that no such prices have been made.

Wire Rods.—The market continues in much the same position as noted for several weeks past. Demand continues very limited and \$30, Pittsburgh, can now be considered as the outside price. The continued shutdown of the Joliet mill of the Illinois Steel Company was expected to favorably affect the market, but as yet has not done so. We quote Rods on a basis of \$29.50 @ \$30, Pittsburgh, and it is intimated that even the first-named low price has been shaded in more than one instance.

Muck Bars.—Demand continues very dull, and about the only trade going in Muck Bars at this time is from Pipe and Tube makers, and as they have made a number of purchases recently, it is fair to presume that their wants are pretty fully supplied for some time to come. We learn of only one sale of Muck Bars since our last report, and this was a lot of 300 tons that changed hands on a basis of \$24.25, delivered at buyer's mill. This can be considered the ruling price in this market.

Merchant Steel.—Quite an increase in volume of business is reported, and the outlook for the future is quite encouraging. It is said that some large buyers are in the market, and the probabilities are that some large contracts will be placed during this month. Pittsburgh makers continue well supplied with business, and several concerns are operating their plants double turn and shipping their product as fast as made.

Skelp Iron.—There is no improvement whatever in demand, and the favorable prices now ruling for Soft Steel have interfered very much with demand for Iron, a number of Pipe and Tube mills running on Steel nearly altogether. Nominally the market may be quoted at 1.47½¢ @ 1.52½¢ for Grooved and 1.67½¢ @ 1.75¢ for Sheared, with the usual terms.

Scrap Iron and Steel.—The past two weeks have been exceedingly dull, very little Scrap material of any kind changing hands. The scarcity in the market of No. 1 Railroad Wrought Scrap seems to have given way to a surplus, and as a consequence prices have gone off very considerably. We now quote No. 1 Railroad Wrought Scrap at \$15 ¢ net ton; Wrought-Iron Turnings are also weaker in price, and we quote these at \$10 ¢ net ton; Cast-Iron Borings are in very limited demand and may be quoted at \$7.50 ¢ gross ton; Leaf Springs are in fair demand and are bringing \$20.25 ¢ gross ton, while Coil Springs are dull at \$18 ¢ gross ton. We note a sale of 100 tons of No. 1 Railroad Wrought Scrap at \$15, delivered at buyer's mill, Pittsburgh.

Old Rails.—The market is exceedingly dull and a very limited amount of material is changing hands. In the absence of any sales reported within the past week, we quote Short Steel Rails nominally at \$15.75 ¢ gross ton; Mixed Rails at \$15 and long lengths at \$15.50 ¢ gross ton.

Bars.—While the volume of business has improved to some extent, prices continue weak and irregular, and some orders recently booked have been taken at prices considerably lower than have ever been made before in this market. Considerable business from Western points has been taken by Pittsburgh makers recently, but as it was only secured after sharp competition with mills located near the points of consumption, it is evident that prices were shaded very considerably. Considerable business from railroads and car builders is expected within a short time,

and if this comes in it will remove to some extent the great pressure now existing among the mills to book enough orders to keep running. We quote best grade of Bars at 1.55¢ @ 1.60¢, Pittsburgh, half extras. Bars in the Mahoning Valley are held at 1.42½¢ @ 1.45¢, half extras.

Wire and Cut Nails.—During January a very large business in Wire Nails was done, and as a consequence prices are showing a firmer tendency, and mills are refusing to book orders at less than \$1.40 base at mill, and a few of them decline to make extended contracts even at that price. All indications point to a prosperous building season during this year, and this is expected to lead to a very large consumption of Wire Nails. The two concerns located at this city are both understood to have booked very largely and are refusing to accept any business at less than \$1.40 at mill. We quote Wire Nails on a basis of \$1.40, Pittsburgh, and it is not believed that this price could be shaded even under very favorable conditions. In regard to Cut Nails, the situation has improved very little, although a slight increase in demand is expected, in sympathy with the increased demand for Wire Nails. Prices are weak, and we continue to quote at \$1.42½ on a 30-cent average, f.o.b. at mill in Wheeling district.

Wire.—As we noted last week, a large number of contracts have been placed, and several makers in this vicinity have sold their entire output for the next 60 or 90 days. It is believed that the consumption of both Plain and Barb Wire for 1893 will be the largest in the history of the trade, and will even greatly exceed the consumption of 1892, which, as is well known, was extremely heavy. Notwithstanding the large amount of business booked since the first of the year, prices have not stiffened up to any extent and we repeat former quotations of \$2 for Plain Barb and \$2.40 for Galvanized, f.o.b. at makers' mill.

Sheets.—Although the time for placing season contracts is here, buyers, for some reason, are holding off, probably with the expectation of getting better prices than are available now. A fair demand is going for small lots, but the situation is disappointing, owing to the fact noted above—that large buyers do not show much inclination to enter the market and place their season contracts. Prices have weakened to some extent since our last report, and we now quote No. 24 Ordinary Black Sheets at 2.50¢ @ 2.55¢, No. 26 at 2.60¢ @ 2.65¢, No. 27 at 2.70¢ @ 2.75¢. For Soft Steel Sheets the usual advance on above prices is obtained. The market on Galvanized Sheets is in about the same condition as noted last week. A fair demand is going, but large buyers are holding back their season contracts with the expectation of getting lower prices when they are ready to buy. Discounts remain at 70 and 7½ % @ 70 and 10 %, according to nature of order, for Best Bloom.

Pipes and Tubes.—Trade continues quiet and new business coming in is confined almost exclusively to small lots, and for the smaller size of Pipes and Tubes. No improvement in the demand can reasonably be expected until the weather is such that outside Pipe laying can be done. In consequence of the limited demand prices are weak and discounts on small-sized Black are ranging from 57½ and 10 % to 57½, 10 and 5 %; on large-sized Black, discounts are 67½, 10 and 5 %, and on large-sized Galvanized 57½, 10 and 5 %, and on small Galvanized 47½, 10 and 5 %.

The Steel Barge Company, at West Superior, Ill., expect to build a number of whalebacks during the next two years, keeping their works fully employed.

Boston.

Office of *The Iron Age*, 146 Franklin St., }
Boston, February 1, 1893. }

Pig Iron.—The Pig Iron market is rather quiet. Brokers and dealers are noting only a moderate trade in the way of new orders, though they are delivering considerable Iron on former orders. The New England consumers of Pig Iron are generally busy, and several of them are unusually busy, and hence the rather quiet demand for Iron is still due to the fact of rather heavy previous buying. Prospects hold good that there is to be a very full consumption of Iron in this part of the country this season, and sellers expect a good trade, unless it is killed by a pressure to sell Iron from the furnaces. The quotations on Southern Iron, laid down in Boston are: No. 1, \$15 @ \$16; No. 2, \$14 @ \$15; No. 3, \$13.50 @ \$14.50. Pennsylvania and Western Irons are quiet, with the quotations at: No. 1, \$15; No. 2, \$14; Gray Forge, \$13.50. These prices are for Iron at shipping port, and spot lots on the market here would cost more by the amount of freight and other charges.

Bar Iron.—The market on Bar Iron continues pretty firm, though the demand is by no means large; but the fact that so few of the Western mills are making iron is helping the one or two rolling mills that are left in New England. The market is quotable at: Ordinary refined Bars, 1.65¢ @ 1.75¢ from mill, and at 1.70¢ @ 1.80¢ from store. The best known brands of Puddled Iron are quoted at 1.85¢ @ 1.95¢, delivered from mill, and at 2.10¢ @ 2.25¢ from store. Norway and Swedish Irons are in strong hands, with the quotations at \$67 @ \$68.50 for Bars, and at \$68.50 @ \$70 ¢ ton for shapes.

Steel and Steel Plates.—The market is fairly active for Steel, but still the tendency is to cut prices for the sake of trade. The strongest feature is that gradually the good business doing fills the larger concerns up with orders and they then cease to compete for a while. The market is quoted at: Bessemer Steel, 2.15¢ @ 2.25¢; Machinery, 2.15¢ @ 2.20¢; Sheet, 2¼¢ @ 2½¢; Tire and Sleigh Shoe, 2¢ @ 2.10¢; American Cast, 7¢ @ 7½¢; English Cast, 14¢ @ 15¢; American Steel Rails, \$29, at mill. An order for 500 tons of Bessemer Bar Steel has just been placed by Bullard & Post with a prominent Rhode Island manufacturing concern. The curious feature of the order is that it is placed for a concern which has never before used Steel for its peculiar forms of manufacture except in the way of experiment. The order was all for Steel of one size.

The nominal price for Steel Rails is still \$29, though the feeling is an uneasy one among buyers and they are not buying freely just now. But there must be a good New England demand some time this season.

The demand for Plates is good, but agents and sellers complain of such low prices that there is no money in them. The agent of the Pottstown Iron Company here, B. F. Butler, Jr., says that the company is going right along with the business the same as ever, and that the matter in adjustment with the company is only the appointment of a receiver; this should not interfere with the business of the company at all, which is one of the largest engaged in the manufacture of Plates. Plates are quotable at: Tank, 1.95¢ @ 2¢; Shell, 2.10¢ @ 2.15¢; Flange, 2.30¢ @ 2.35¢; Fire Box, 2.65¢ @ 3.50¢.

Structural Iron.—The position of Structural Iron is fairly active, with some small contracts being placed for buildings and bridges, but no very large contracts have been placed within a week. The

quotations are at: Beams and Channels, 2.10¢ @ 2.20¢ from mill and 2.75¢ @ 3¢ from store; Angles, 2¢ @ 2.12½¢ from mill and 2.25¢ @ 2.50¢ from store; Tees, 2.40¢ @ 2.50¢ from mill and at 2.50¢ @ 3.25¢ from store.

Pipe and Tubes.—The market is steady on Pipe with a very fair winter business. It is mentioned that there are some good-sized water contracts to be placed soon. The city of Boston has proposals out for 3000 tons of Cast Iron Pipe. The manufacturers made no changes in prices at their last meeting, and hence the trade here is holding prices steady; Butt-Welded, ¾ to 1½ inch, Plain and Tarred, 55 % off from list; Enameled, 52½ % off; Galvanized, 47½ % off; Lap-Welded, 1½ @ 12 inch, Plain and Tarred, 65 % off; Enameled, 62½ % off; Galvanized, 52½ % off. Large lots are sold at 2½ to 5 % greater discounts.

Old Iron is very dull and prices are unchanged.

It is currently reported in the trade that the New England Steel Company of Worcester, formerly managed by G. M. Rice, has again closed down. It is also believed in the trade that it has closed this time not to reopen.

The famous great ocean tubular pier at Long Branch is to be torn down and sold for old iron. It was built in 1878 and originally cost \$125,000.

New York.

Office of *The Iron Age*, 95-102 Reade street, }
New York, February 1, 1893. }

Pig Iron.—The market is very quiet, with indications that both some Southern and some Northern companies are endeavoring to stimulate business by shading prices. A sale of about 500 tons of a Lehigh brand of Foundry Iron was made at an exceptionally low price this week. We quote Northern brands at \$14.75 @ \$15.25 for No. 1; \$14 @ \$14.50 for No. 2, \$13 @ \$13.50 for Gray Forge, tidewater. Southern Iron, same delivery, \$14.75 @ \$15 for No. 1; \$13.75 @ \$14 for No. 2 and No. 1 Soft; \$13.25 @ \$13.50 for No. 2 Soft; \$12.75 @ \$13 for Gray Forge.

Spiegeleisen and Ferromanganese.—The market is very quiet, with 20% Spiegeleisen nominally \$25.50 @ \$26, and Ferromanganese \$56.50 @ \$57, tidewater.

Billets and Rods.—The only transaction recorded is a sale of about 1500 tons of Foreign Wire Rods, Pacific Coast delivery, at private terms to two different works. Domestic Billets and Rods are weaker. We quote Steel Billets, tidewater, \$24.25 @ \$24.75; foreign, \$29 @ \$29.50; Wire Rods, \$32.25 @ \$32.75; foreign Wire Rods, \$40 @ \$40.50, and Swedish Rods, \$54.50 @ \$56.

Steel Rails.—Eastern mills have taken contracts for over 70,000 tons, which includes sales of 60,000 tons to the Pennsylvania Railroad. This transaction is regarded as being of unusual interest, since it indicates that the great trunk line is placing its contracts. For many years it has been the practice of a considerable number of railroads throughout the country to follow the Pennsylvania in making purchases. Its entering into the market is a signal for more extensive buying, and it is believed that this year a similar movement will now take place. The Pennsylvania company usually distribute their orders among the three mills on the line of their road and occasionally give a relatively small quantity to one of the outside works. It is not yet known whether all the mills on the line of the road have received their orders. If the transactions have not yet been closed, they are likely to be concluded at an early date. Rumors that special figures

are being made or that particular inducements are offered in other ways are still current and obtain a good deal of credence in the trade. We continue to quote \$39 at mill or at tidewater, according to location of works. The heavy movement in Girder and Tee Rails for street and suburban roads continues, from 80 to 100 miles of track having been given out in the last ten days, involving about 15,000 tons of Rails. The greater part of this is taken in Philadelphia, one syndicate alone contracting for 55 miles of 90 lb Rails, of which the Pennsylvania Steel Company secured 35 miles and the Wharton Company 20 miles. For suburban lines where standard railroad track can be used the electric roads are buying 75 and 80 lb Standard Tee Rails, making the roadbed as heavy as that of the principal steam lines. Girder Rails are selling at \$35 @ \$36 per ton. A meeting of the Rail Mill Association will be held in this city at an early date.

Manufactured Iron and Steel.—The prospects for work in this particular locality are regarded as excellent. A number of office, bank and public buildings are known to be in architects' hands which will call in the aggregate for 7500 to 8000 tons of Beams within the next 90 days. This includes such structures as the Continental Life, Lincoln Bank, a large hospital, the Manhattan Life, the Astor residence, Corn Exchange Bank, Jewelers' Building and others. There are other structures being practically decided upon which will add several thousand tons more to the demand for Beams during the first six months. In addition to this there is the consumption of small lots for residences, flats and stores. Altogether, it seems certain that the consumption of Beams and Structural Material in the city of New York and immediate vicinity will be unprecedently large this year. The only contracts of magnitude placed during the last week were the Structural Material for the Brooklyn terminal station of the bridge, and a large bridge for the Long Island, the former involving about 1000 tons of Steel. The market, in spite of the excellent prospects, continues low in all lines. We may note that the first quotations are now being made on Cotton Ties at 85¢ per bundle at mill, equivalent to 96¢ at Baltimore. As yet nothing has been done. We quote Beams at 2.25¢ @ 2.75¢ for small lots and 1.95¢ @ 2.25¢ for round lots, according to sizes; Angles, 1.85¢ @ 2¢; Sheared Plates, 1.85¢ @ 2.10¢; Tees, 2.10¢ @ 2.30¢; Channels, 2.10¢ @ 2.20¢, on dock. Car Truck Channels, 2¢ @ 2.10¢. Steel Plates are 1.85¢ @ 2¢ for Tank; 2.10¢ @ 2.25¢ for Shell; 2.40¢ @ 2.65¢ for Flange; 2.5¢ @ 2.75¢ for Marine, and 2.60¢ @ 2.80¢ for Fire Box, on dock. Refined Bars are 1.65¢ @ 1.9¢, on dock; Common, 1.55¢ @ 1.60¢. Scrap Axles are quotable at 1.90¢ @ 2.10¢, delivered. Steel Axles, 1.85¢ @ 2¢, and Links and Pins, 1.85¢ @ 2.10¢; Steel Hoops, 1.90¢ @ 2¢, delivered.

Track Material.—We quote Spikes, 1.90¢ @ 2¢; Fish Plates, 1.60¢ @ 1.65¢; Track Bolts, square nuts, 2.40¢ @ 2.60¢, and hexagon nuts, 2.70¢ @ 2.80¢, delivered.

Metal Market.

Copper.—There is no perceptible change in the situation. Manufacturers of the general line of Copper and Brass Goods are well employed, the future of those branches of trade looks promising, and all signs point to a very much heavier consumption for electrical purposes in various parts of the country. For the moment, however, the demand is tame, and enough small lots are knocking about to impart a sort of weakish appearance to the market. Thus, parcels of 25,000 lb of Lake Ingot have been offered at 12¢,

net cash, without finding takers; and in remote instances that rate has been quoted with broader terms of sale. The entire offering could doubtless be absorbed by one ordinary purchase by any consumer of prominence. Upon the whole, the cheap offering is apparently on the "job lot" order, and when cost of handling, &c., is taken into consideration, the apparently low rate is no more advantageous to consumers than the 12½¢ and 12½¢ quotations, regular terms, made by the mining companies. As there is no sign of pressure to sell by the producers' representatives the superficial "bearish" features of the market, it would seem, are receiving quite as much or more prominence than they deserve. Casting Copper has been quite as slow as the finer metal, yet enough business passes to keep prices fairly steady at 11½¢ @ 11½¢ for wholesale quantities. Exports from New York to Europe during the four weeks ending January 28 were equivalent to 897,098 lb Fine Copper; total from January 1 to date, 4,831,439 lb Fine, against 6,485,500 lb during the corresponding period last year.

Tin.—The transactions recorded on the Metal Exchange up to Wednesday involve about 600 tons, including spot at 20 10¢ @ 20 ¾¢, January delivery at 20 05¢ @ 20 10¢, February at 20 10¢ @ 20 22½¢, March at 20 ¾¢ @ 20 32½¢ and April at 20 35¢ @ 20 42½¢. During the same time a moderate business was effected outside, on regular terms, at prices remarkably close to those quotations; but, with free arrivals, it is doubtful whether the spot statistical position has changed for the better. Data of movement from the Straits also tended to impair the statistical position, the returns showing total shipments of 4000 tons during January, against 2980 tons in December, of which quantity 3650 tons were for Great Britain and the United States. Between the statistical exhibit, the legislation on "options" and uncertainties regarding the McKimley tariff, the horizon is variegated to an extent that bewilders nearly everybody identified with the market, as merchant, broker or speculator.

Pig Lead.—Large Consumers have secured a few hundred tons of Common domestic at 3.85¢ @ 3½¢, and more at 3.90¢. All told they have taken at least 1000 tons during the past week for shipment during the next 60 days. Some few single carload lots subsequently realized 3.92½¢, and at present sellers at less than 3.95¢ are extremely few and far between. The low price of silver and the annual January curtailment of work at some mines, along with the periodical "shut-downs" here and there, are brought to the surface as factors in regulating values. Whatever there may be behind all this is problematical, but the result thus far is practically as outlined above, and the market shows firmness in tone that is not only interesting, but doubtless a little surprising in some quarters.

Spelter.—The offering of Western brands at 1.35¢, delivered in the East, is quite as free at the present time as it was a week ago. The demand has not improved, at least not sufficiently to be perceptible in this market. Some shipments to Europe have been made, but orders from that quarter are exceedingly few and far between, since prices for foreign product have receded. There is no open quotation of less than 4.35¢ here by sellers, but bids of 4.30¢ have been solicited in a manner suggestive of some anxiety to sell. Upon the whole the market looks rather soft.

Antimony.—Except for ordinary quantities there has been no inquiry. Supplies are ample and prices continue somewhat irregular, with the range of 10½¢ @ 10½¢

quoted for Hallett's, 10½¢ @ 10½¢ for LX and 10½¢ @ 11¢ for Cookson's, as to quantity.

Tin Plate.—Very good orders have been secured from can makers and canners for 100 lb and lighter Bessemer Steel Coke finish Plates, with prices on latest dealings about 2½¢ per box above the lowest rates recently established. Special sizes used by petroleum canners have also been taken to a fair extent. Otherwise the business in futures makes a modest showing, and spot trade to all accounts continues to be of strictly routine character. For ordinary store lots the former line of prices is quoted, but in the instance of Coke Plates, at least, the tone of the market is a shade steadier. We quote as follows: Coke Tins—Penlan grade, IC, 14 x 20, scarce; J. B. grade, do., scarce; Bessemer full weight, \$5.35; light weights, \$5.10 for 100 lb, \$4.95 for 95 lb, \$4.80 for 90 lb. Siemens Steel scarce. Stamping Plates—Bessemer Steel, Coke finish, IC basis, \$5.60 @ \$5.65; Siemens Steel, IC basis, \$5.75; IX basis, \$6.85. IC Charcoals—Melyn grade, ½ X assortment, \$6.40; Crosses, \$8; Allaway grade, any assortment, \$5.70; Crosses, \$7; Grange grade, any assortment, \$5.80; Crosses, \$7.10. Charcoal Terns—Worcester, 14 x 20, \$5.70; do., 20 x 28, \$11.35; M. F., 14 x 20, \$7.75; do., 20 x 28, \$13.50; Dean grade, 14 x 20, \$5.30 @ \$5.35; do., 20 x 28, \$10.50 @ \$10.60; D. R. D. grade, 14 x 20, \$5.25; do., 20 x 28, \$10.50; Dyffryn, 14 x 20, \$5.50; do., 20 x 28, scarce. Wasters—S. T. P. grade, 14 x 20, \$5; do., 20 x 28, \$9.75; Abercarne grade, 14 x 20, \$4.95; do., 20 x 28, \$9.62½.

Financial.

The lifting of the ice embargo at tide-water points has permitted a more general movement of merchandise, and manufacturers who were embarrassed by lack of fuel again have their accustomed supplies. Navigable rivers are also much improved and the outlook for the spring trade is good, except as the currency question introduces an element of uncertainty. Undoubtedly the continued free shipments of gold are a menace to the United States Treasury, whose gold surplus has been reduced to a low margin, exciting more or less apprehension concerning the future. Bank officers have conferred informally respecting the relief which it might be possible to extend, but no definite action has been taken. The amount of free gold in the Treasury is less than \$10,000,000 beyond the \$100,000 reserve for greenback redemption. Gold shipments this week, fortunately, are only about \$1,500,000 as compared with about \$4,000,000 the previous week. Since January 1 the total specie shipments are \$13,000,000 as compared with less than \$2,000,000 to the same time in 1892. Prospects for remedial legislation at the present session of Congress are as dubious as ever. A. B. Hepburn, of banking fame, says the aggregate circulation of the five kinds of paper money is \$899,562,711. Until the future is more assured there will be reluctance to engage in new undertakings.

On the stock exchange transactions have been large, but nearly all were of a professional nature, whisky and sugar stocks making one half of the total trading. Reading and tobacco, otherwise known as the Cigarette Trust, also figured conspicuously. Delaware, Lackawanna & Western advanced on the publication of the preliminary statement, and Delaware & Hudson was strong on its favorable report, while Reading was bought on the Arnot decision in Pennsylvania. The question is raised whether this speculation in the so-called "industrials" will not work in-

jury to the general market, as affecting stocks and bonds. The disturbance from this source was particularly noticed on Monday, when fluctuations were wild through the entire list, which closed very weak. Whisky, which a week before sold as high as 72½, sold at 38.

United States bonds were quoted as follows:

U. S. 4½s, 1891, extended.....	100
U. S. 4s, 1907, registered.....	113¾ @ 114¼
U. S. 4s, 1907, coupon.....	113¾ @ 114¼
U. S. currency 6s, 1895.....	105

The weekly statement of the Associated banks was favorable, showing an increase in reserve of \$613,700, which brings the amount held in excess of legal requirements up to \$23,143,300. The broadening of speculation at the Stock Exchange accounts for the large expansion of \$8,105,800 in loans. The loan market was active but easy. For time loans on good Stock Exchange collateral rates are 3½ per cent. for 30 days, 4 per cent. for 60 days to four months, and 4½ per cent. for contracts extending over five to six months. Commercial paper is in good demand, both from city buyers and those out of town. A reduction in the minimum rate of interest by the Bank of England from 3 per cent. to 2½ per cent. was a favorable incident, although it was made to conform more closely with the rate in the open market.

Bar silver in London was ½d lower, at 38½d per ounce; New York dealers' price 83½c per ounce.

Wall street is much exercised by the proposition to start a new bank with a heavy capital. Daniel S. Lamont, William C. Whitney and others interested in Manhattan, Standard Oil, &c., are said to be among the stockholders.

The merchandise markets are without notable change. Wheat fluctuates within narrow limits. The available surplus is estimated by good authority at 224,000,000 bushels, against 277,000,000 at the corresponding date last year. Provisions strong and further advanced on short supply. Cotton is inactive. Coffee firm. Raw sugar firm; refined only steady. Cotton seed oil is booming.

The New York State Board of Trade assembles at Albany, February 15. That body represents 31 commercial organizations.

The German Iron Trade.

(One mark per metric ton is equivalent to 24.8 cents per gross ton.)

DUSSELDORF, January 14, 1893.

The strike in the Saar district is steadily declining. Yesterday out of a total of 30,000 men 18,594 had resumed. The Royal Mining Bureau had dismissed 440 men finally. The bureau takes a very strong position against the striking workmen and it is probable that the contest will be over in the course of the week. In the Ruhr district the sympathetic strike increased until Thursday, when 20,656 men had stopped work. On Friday the number of striking workmen was only 16,500 out of a total of 130,000 to 140,000 men in the Ruhr district. At Gelsenkirchen several dynamite outrages occurred and numerous arrests have been made. Other difficulties did not occur.

In the Iron trade the business drags. Some of the works are suffering from a lack of fuel, so that, for instance, Phoenix was forced to a partial stoppage. All the Iron works agree in stating that at the low prices now prevailing they would rather stop entirely than pay higher prices for coal.

The consolidation between the Krupp and the Gruson works is still the topic of discussion. The arrangement is generally regarded as a very sensible one, because the Gruson works were on the point of build-

ing an Armor Platemill, which would have forced Krupp to follow suit. The existence of two great establishments would have led to overproduction and this is avoided by the consolidation.

It is probable that a law will be passed making it obligatory with all cities having more than 15,000 inhabitants to put in water works. It is, therefore, believed that there will be more activity in the Pipe trade and among builders of Pumping machinery.

British Iron and Metal Markets.

[Special Cable Dispatch to The Iron Age.]

LONDON, WEDNESDAY, February 1, 1893.

On Friday last the price of Scotch Pig Iron warrants was forced as high as 45/3 under pressure of purchases to cover maturing obligations on oversold accounts. Since then the "bear" interest have experienced difficulty in covering, and few spot warrants went below 45/, although two months' futures were put out at as low as 42/. Cleveland warrants have been almost neglected and rather weak at 35/ @ 35/3. Hematites have fared as poorly at 45/9 @ 46/. All Barrow furnaces have been damped, but the output in the other districts proves to be sufficient to meet all demands. Stocks in public stores have increased somewhat, the latest returns showing a total of 337,000 tons Scotch and 33,000 tons Cleveland.

The Pig-Tin market has been irregular and rather weaker, owing to free selling by importers and realizations by outside holders. Large purchases, particularly of futures, were made on each decline, but the support has not been sufficient to impart stability to value in the face of heavy Straits shipments.

Copper has averaged a shade lower, under the influence of realizations by tired holders and limited demand from consumers. Spot stocks, however, are believed to be well concentrated.

Tin Plate is steadier, more particularly for Oil sizes and regular Bessemer, the demand for which has been very fair. Charcoal Plates are a drug upon the market at present. Orders for Black Plate are lighter, and prices are easy at £8. 10/. Stocks of Tin Plate in Swansea amount to 168,000 boxes, against 129,000 boxes a year ago. Exports to Batoum have been quite heavy of late.

Scotch Pig Iron.—Prices for most brands are firmly held, but the market remains quiet.

No. 1 Coitness, f.o.b. Glasgow.....	54 6
No. 1 Summerlee, " ".....	51/
No. 1 Gartsherrie, " ".....	51/6
No. 1 Langloan, " ".....	53/
No. 1 Carnbroe, " ".....	46/
No. 1 Shotts, " at Leith.....	53/
No. 1 Gtengarnock, " Ardrossan.....	49/6
No. 1 Dalmeilington, " ".....	47/6
No. 1 Eglinton, " ".....	46/
Steamer freights, Glasgow to New York, 1/;	
Liverpool to New York, 1/6.	

Cleveland Pig.—Market quiet and prices easy, with makers offering at 35/3, f.o.b. shipping port, for No. 3 Middlesborough.

Bessemer Pig.—Slow market, but prices steady at about 47/6 for West Coast brands, Nos. 1, 2 and 3, f.o.b. shipping port.

Ferromanganese.—The market very quiet and prices easy. English 80 % quoted at £11. 10/, f.o.b. shipping port.

Steel Rails.—No improvement in the demand or change in sellers' prices. Heavy sections quoted at £4, f.o.b. shipping port.

Steel Slabs.—Market dull and unchanged. Bessemer quoted at £4, f.o.b. at shipping point.

Steel Billets.—Moderate business chiefly at old prices. Bessemer, 2½ x 2½ inches, quoted at £4, f.o.b. shipping point.

Steel Blooms.—Business slow and prices greatly nominal. Makers quote £4 for 7 x 7, f.o.b. shipping point.

Old Iron Rails.—Demand still moderate and prices rather easy. Tees quoted at £2. 7/6 @ £2. 10/ and Double Heads at £2. 10/ @ £2. 12/6, f.o.b.

Scrap Iron.—A light business passing at about former rates. Heavy Wrought Iron quoted at £2, f.o.b.

Crop Ends.—Very little doing and prices nominal. Bessemer quoted at £2. 7/6 @ £2. 10/, f.o.b.

Manufactured Iron.—The market is slow and prices still lean in buyers' favor. We quote, f.o.b. Liverpool:

	£ s. d.	£ s. d.
Staff, Ordinary Marked Bars	8 0 0	@ 6 7 6
Common	6 5 0	@ 6 7 6
Staff, Bl'k Sheet, singles	7 7 6	@ 7 10 0
Welsh Bars (f.o.b. Wales)	5 7 6	@ 5 10 0

Tin Plate.—Rather firmer, market at the close with business fair. We quote, f.o.b. Liverpool:

IC Charcoal, Alloway grade	13/6 @ 13/9
IC Bessemer Steel, Coke finish	12/0 @ 12/3
IC Siemens	12/3 @ 12/6
IC Coke, B. V. grade 14 x 20	12/0 @ 12/3
Charcoal Terme, Dean grade	11/9 @ 12/3

Pig Tin.—Market closed quiet and rather easy. Straits quoted at £91. 15/ @ £91. 17/6 for spot and £92. 7/6 @ £92. 10/ for three months' futures.

Copper.—Rather slow market and prices barely steady. Merchant Bars quoted at £45. 2/6, spot, and £45. 12/6 three months' futures. Best selected, £49. @ £49. 10/.

Lead.—Offerings freer and the market easier at £9. 15/ for Soft Spanish.

Spelter.—Demand slow and the market weaker at £17. 5/ for ordinary Silesian.

The Chicago Pig Lead Market.—The Post-Boynton-Strong Company, Home Insurance Building, Chicago, have furnished us with the following table of monthly averages of Pig Lead in Chicago for 1892 and the average for each year since 1884:

	Cents.
January	4.00
February	3.93
March	4.00
April	4.12½
May	4.12½
June	4.05
July	4.07½
August	3.97½
September	3.95
October	3.82
November	3.70
December	3.55
Average for the year 1892	3.94
Average for the year 1891	4.19
Average for the year 1890	4.28
Average for the year 1889	3.67½
Average for the year 1888	4.30
Average for the year 1887	4.34
Average for the year 1886	4.50
Average for the year 1885	3.83
Average for the year 1884	3.58

They add the following remarks: "The highest price last year was in April, 4.17½¢, and the lowest, in December, 3.52½¢. The average for the year is ½¢ per lb below 1891, and, excepting 1889, is lower than any year since 1885. There has been little material change in the position of Lead the past week, although the inquiry is somewhat better at all centers, and values both at home and abroad show a hardening tendency. Sellers, generally, are very firm in their views, and there is

really no metal pressing for sale. Consumers, on the other hand, are looking on, not anticipating requirements; fearing possible changes in the tariff, &c. The general position of Lead is most peculiar. Consumption is fair. There are no stocks anywhere, these having been absorbed in the past year; yet the price keeps low and there is no snap to trade. However, Lead is not the exception. The other metals—Tin, Copper, Antimony, Spelter and Iron—have seldom averaged so low in price as they do to-day. Closing quotations for Lead are: St. Louis, 3.62½¢ @ 3.65¢; Chicago, 3.67½¢ @ 3.70¢; New York, 3.85¢ @ 3.90¢; London, £9. 17/6 @ £10."

The Pottstown Iron Company.

Jacob Fegeley and Wm. N. Gordon have been appointed receivers of the Pottstown Company, on application made by the South Bethlehem National Bank, the National Iron Bank of the Pottstown Security Company of Pottstown, Israel Morris, William H. Morris and Thomas H. Morris. The attorney for the receivers states that the company expect to pay in full if given time, and action was taken to avoid sacrificing assets, which are mostly invested in plant, real estate, &c.

The assets of the company are said to be real estate and plant, at costs, \$3,000,000. Stock on hand, raw and manufactured, is estimated at \$390,000, the accounts receivable at \$350,000. The liabilities are: Bills payable, \$868,000; accounts payable, \$227,000; wages, \$30,000. The bonded indebtedness secured by first mortgage is \$900,000, \$276,000 of which are pledged as collateral. The authorized capital is \$1,000,000, \$884,000 of which has been issued as full paid.

The company were incorporated in 1865 under the laws of Pennsylvania, with an authorized capital of \$500,000, par value of shares \$100 each. Their old plant consists of a blast furnace, sheet, plate and nail mills, fully equipped with machinery and tools. Wm. H. Morris is president, Andrew Wheeler vice-president and Wm. M. Gordon treasurer. In December, 1890, their vice-president stated that they had their steel plant successfully running, manufacturing 150 tons per day. They also manufacture 100 tons of finished iron per day, 1000 tons of puddle bars per week, and their nail factory is in active operation, turning out a large quantity of nails weekly. They pay their current bills in 30 days, settling large purchases by four months' notes, which are promptly paid when due. He could not give the amount of their bills payable, but said it was over \$1,000,000. In 1885 they claimed a surplus of \$500,000, and bought a large farm at the southern end of Pottstown, on which they erected a large steel plant, laid out the village and erected houses for their employees, to do which they increased their bonded debt from \$250,000 to \$1,000,000. The steel mill for a long time did not operate successfully and they lost money, but since starting up in August, 1890, they claimed to be doing well.

It is reported on good authority that W. J. Rainey, the well-known Connellsville coke operator with offices at Cleveland, Ohio, has purchased the Mount Braddock Coke Works, situated in the Connellsville region, and owned by Robert Hogsett. The consideration is said to have been \$485,000.

(By Telegraph.)

WASHINGTON, February 1.—The bids on armor plate have been postponed for one week, pending the approval of the specifications in the matter of ballistic tests of the thicker Harveyized plates.

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HARDWARE.

Condition of Trade.

JANUARY BUSINESS was affected to some extent by the general prevalence of severe wintry weather, which, while it operated advantageously in promoting the sale of seasonable goods, interfered to a good extent with general trade. The reports which come to us, however, indicate that the aggregate of the month's business is fully up to the average, and in many cases has probably exceeded it. February opens with a fair demand, as the trade are placing their orders more freely, and a confident tone prevails which promises well for future business. Prices are without important change and the market as a whole is not characterized by a strong tone, a good many of the staple goods being exceptionally low. It is, however, thought by many that, in view of the large demand which is anticipated, there may be a strengthening of prices in some lines. There is some complaint in regard to collections. The reports which are given below from the principal Hardware centers will be of interest as indicating the condition of business and the outlook for trade in these markets.

Chicago.

(By Telegraph.)

Shelf Hardware has been much more active during the past week and jobbers say that their trade for the month ran ahead of that of last January, which was considered a very good month indeed. The demand has latterly taken in staple goods, and carload orders are frequent for Wire Nails and Barb Wire. The trade in Wire Cloth, Poultry Netting, Screen Doors, Refrigerators, Farming Tools and other steel goods and seasonable articles for the spring trade is not only keeping up, but increasing in volume. Manufacturers' agents are especially jubilant over the excellent start made for the year, reporting an unusually good run of orders, and they are inclined to believe that prices will stiffen if the heavy demand for Shelf Hardware continues. Heavy Hardware is not so active as Shelf and complaints are rife of prices being cut to influence business.

St. Louis.

(By Telegraph.)

The demand for Shelf Hardware continues to be very active, and dealers are also placing some good orders for summer goods, such as Refrigerators, Screen Doors, &c. Hardwaremen who handle Merchant Iron have bought liberally during the past week, as prices were lower than they have been for some time. Tin Plates, Copper

Goods and Hollow Ware are all in urgent demand, as well as Wire Nails, and, to a certain extent, Builders' Hardware. There is a fair trade doing in Barb Wire, but prices are inclined to weakness.

Philadelphia.

SUPPLIEE HARDWARE COMPANY.—There has been an improvement in trade circles during the past week. Purchases have been perceptibly larger and orders more frequent. Substantial gains are reported from the various railroad stations in our city, both in regard to outgoing and incoming merchandise.

Water transportation to Southern ports has been materially interfered with during the past three weeks owing to the blocked conditions of the river from ice and snow, during which time shipments were necessarily made by rail, but considerable detention in freight has been reported, and in many cases some inconvenience has been the result.

The blocked conditions of the country have prevented the usual volume of remittances expected immediately after January 1. The interior trade depend largely upon settlements with their customers January 1 to liquidate indebtedness, but the weather and roads have given ample excuse for delay in making remittances.

The Polar weather has given place to a more moderate degree of temperature, but the melting snow is not yet favorable to the farmer, and the temporary effects are still visible.

The stability of the market prices of Hardware is, doubtless, influenced by the large sales of Pig Iron, as well as structural material, which have during the last two weeks been exceptionally large.

The manufacturers of Hardware unprotected by patents still complain of the margins of profit, and regret their inability to escape from the slough or trough of unremunerative prices.

All the trade, both wholesale and retail, have no doubt noticed the gradual growing inclination for improved quality of Hardware, especially Building Hardware, which is now being called for, not only in all the public buildings, but private residences that are being erected; and he who reads should profit thereby.

The cheap, ungainly and less durable Locks and Knobs are no longer rivals in the specifications of the architect, and the interior merchant will do well not to rely upon sales based upon former requirements. We have known many instances recently where the entire Hardware purchased and placed in houses has been taken out and replaced by a better grade, quadruple in cost, before occupancy of the buildings; and was ever folly more apparent than to build fine and expensive residences, with all modern improvements, which the present artistic taste and education demands,

and decorate the doors and windows with the hideous cheapness forced upon the market by competitive makers within the last few years, and which kind of cheap Building Hardware could only be found formerly in the ordinary Hardware houses?

Those retail Hardware houses who were the first to realize the present advanced desire for improved Hardware have not only profited themselves, but have conferred a lasting obligation on others.

The various comprehensive illustrated catalogues recently issued by some of the Hardware houses fully illustrate this change in style and quality of goods, and it is an easy matter for the trade to gain experience, which otherwise might be a difficult problem.

The manufacturers of Barb Wire and Wire Nails continue in the rivalry of how low a price can be reached on these goods; and as they deem it wise to fully circulate their prices direct to the smaller buyers, jobbers as a rule beg not to be included as aspirants in the arena, and hold their prices at a small percentage over cost, either for direct shipments or from stock.

Baltimore.

CARLIN & FULTON.—It is no doubt the experience of all who have done a Southern business that the trade for the month just ended has in volume largely exceeded that of one year ago, and there is no reason to suppose that February will show any different results. The remarkable weather which prevailed during the whole month has in this immediate neighborhood hampered trade very greatly, and by the freezing up of many of our harbors has interfered greatly with shipments and caused no little interruption to the business of our water lines.

While locomotion, on account of the deep snows, has been almost impossible in certain sections, now that the milder weather has followed, the danger to be apprehended is from the substitution of mud, which would not be the case were the country blessed with good macadamized roads. It is sincerely to be hoped that at some time we will all realize the fact that nothing can add so greatly to the prosperity of any land as a good system of roads, which will prevent the ever-recurring paralysis of trade whenever the country is deluged by a heavy rain or subjected to a thaw after a winter's freeze.

In regard to prices, staple goods continue very low and buyers can well afford to carry full stocks without fear of decline. The advance in Wood Planes in January, after the extreme low prices which have ruled, might have been expected, and the change in list of Wrought Butts, which plays havoc with catalogues, seemed necessary to the manufacturer to realize a better profit.

Where the weather has interfered with

business, remittances have also diminished, but otherwise collections are up to the average, and the statistics of the mercantile agencies show diminished failures as the rule in all sections.

Louisville.

W. B. BELKNAP & Co.—The long period of extreme cold, lasting here nearly a month and evoking a great deal of meteorological literature in the newspapers and refreshing the memories of old inhabitants, has been succeeded by mild, open weather, with floods of bright sunshine instead of water, as was feared might be the case. Hard rains on top of the widespread snow, and with the ground in such a condition that not a drop could have entered the soil, would have meant a sudden and destructive rise in Western water courses. The danger is not altogether over yet, but it is lessened with every day of the present weather and temperature. The ice in the Ohio is still firm, being broken up at this port by persistent effort of tugs and saws and dynamite, but, owing to the low stage of the water, it has not floated away over the falls, as was desired.

Meanwhile, the rivers being closed, all of the freight that they usually carry has been crowded on to the railroads, in addition to what they already had, which taxed them to their full capacity. Complaints of no cars and slow movement are very general. In fact, the time between Eastern points and here is not as good as it was five or six years ago. Then, under special effort, the Star Union and competing lines brought freight from New York to Louisville in four days, sometimes making it on the morning of the fourth day, and this was kept up quite a while, but now eight to ten days is nothing unusual, and no apologies are considered necessary on the part of the agents of the so-called "fast freight lines."

Freight from interior points is still worse as to time. Freights are just arriving which have been out from Pittsburgh since December, and much that was shipped early this month has not appeared yet. This, too, over such lines as make a great point of their superior facilities.

It looks to us as though the railroads would be very full of business during the whole year. The demands of the country have really outgrown their capacity. The inducement to increase their capacity as to tracks, motive power and rolling stocks has been killed or weakened by the adverse legislation which is either in process or always threatening. This persistent "plucking" of railroads by the granger element and the more vicious town element is bearing fruit most unhappily in Kansas, Texas, Georgia and other States.

Some of the leading newspapers—one in Atlanta we have in mind especially—which a while back was urging the State regulation of railroads, is now begging the legislatures to keep hands off, as the disastrous effect of undue interference is being felt in the business of the whole State. The sooner the legislatures learn that it is not their province to fix the price on com-

modities the better it will be for the communities which they represent.

Cleveland.

THE W. BINGHAM COMPANY.—Trade for January may be summed up as having been exceptionally good, orders (not only for immediate shipment, but for future, on such season goods as Refrigerators, Ice Cream Freezers, Haying Tools, Lawn Mowers, Wire Screens, &c.) being more numerous than for any January in a long time. Orders for Wire and Wire Nails are also coming in very satisfactorily so far as volume is concerned, purchasers undoubtedly feeling that the market has touched bottom, and as there is an evident feeling among the manufacturers of these commodities that it is time to call a halt on the downward tendency of things, dealers are seeking to get under cover before any advances take place. The Bicycle business is now very active. Almost every one directly interested attended the show at Philadelphia and after looking the ground over decided which lines to handle, and orders are being freely placed. There are no material changes in the way of prices to note. Money is becoming somewhat tight in this market, but collections are fair.

Boston.

BIGELOW & DOWSE.—January is a quiet month in the Hardware line, and therefore devoid of any special interest, except to those anxious to know the result of their business for the previous year.

There has been an unusual amount of cold weather, and the ice crop in New England is enormous and the quality simply perfect. There was no snow until the ice had reached a thickness of 18 to 24 inches. Nature has been very considerate in helping dealers to dispose of their stock of Skates, Sleds and other seasonable goods to an unusual extent.

The outlook for 1893 is very encouraging, and with a few exceptions prices seem very firm.

Portland, Ore.

CORBETT, FAILING & ROBERTSON.—Trade during the first month of the new year has been fair considering the disadvantages we have at present to contend with. The first of these was poor collections. Not for years has there been the complaint that has prevailed since last November to the present time, and the prospects in some sections are no better for the future.

Another drawback is the unsettled matter of railroad rates. This, however, does not affect the Hardware trade as seriously as some other lines, as our wants for six months to come have been anticipated by shipments by Cape Horn at extremely low rates of freight. The uncertainty, however, as to whether there is to be a war of rates prevents many dealers from ordering at this season.

We have had a very mild winter so far. In Eastern Oregon and Washington the prospects would be much better if they had snow.

The only changes to report is a decline

of 15 cents per keg for Steel Cut and Wire Nails. Barbed Wire also has declined 25 cents per 100 pounds for Painted and 35 cents for Galvanized.

New Orleans.

A. BALDWIN & Co.—Increased activity in all lines with an unusual demand for Shelf Hardware, in connection with the largest spring business we have done for years, about covers the situation in this section of the country for the past three weeks. Bright, pleasant weather, with a better financial outlook, has infused new life into the planters and merchants and they are beginning the new year evidently intending to offset the drawbacks of the past season.

Omaha.

LEE-CLARKE-ANDRESEN HARDWARE COMPANY.—The two weeks just closed have not been very productive of new features as regards the wholesale Hardware trade of this market. The volume of business continues very satisfactory and decidedly in excess of this month a year ago. The indications all point to a continuance of a comparatively good trade in all lines for some time to come. We are pleased to note that the question of freight rates is receiving the attention of our State Legislature. For a long period this section of the country has been discriminated against with excessive rates which have tended to retard the growth of the State and handicapped its producers. It is high time to "call the turn," and we trust such legislation will be formulated that will secure to our people the necessary modifications and place us on an equal footing with sister States who have already reduced this question to an equitable basis.

Notes on Prices.

Cut Nails.—Cut Nails are in substantially the same condition as at our last review, the market having changed but little in the matter of price, with, however, a somewhat improved demand. Eastern mills are pursuing a conservative course with reference to production, being careful to avoid the accumulation of heavy stocks. The market is represented by the quotation of \$1.40 for carload lots at mill on a 35-cent average. Small lots from store in New York are held at \$1.75 to \$1.80 and carload lots on dock at \$1.65 on a 35-cent average.

As announced in another column, the representatives of the Eastern and Western Nail manufacturers met in Philadelphia yesterday and adopted a National Price-List on Cut Nails, which goes into effect immediately and takes the place of the Nail card which has been in use. It was not formally determined by the meeting what would be the discount or the abatement from the list, this matter being left for the present to the judgment of each manufacturer. A prominent New York house advise us that the rebate will probably be \$1.20 per keg, at the mill, in carload lots, and \$1 on small lots from store in New York.

Chicago, by Telegraph.—Manufacturers are doing a moderate business, but the local factories manage to pick up sufficient trade to keep running very steadily. The current price continues to be \$1.60 on 30-cent average, the only variations being an occasional cut of a cent or two per keg by distant factory seeking to retain a foothold here. Jobbers quote \$1.65 to \$1.70 on small lots from stock.

Wire Nails.—The demand for Wire Nails is unusually large, the mills receiving some heavy orders from large purchasers, and also a good many from the trade at large. Notwithstanding this fact there is no improvement in prices and the quotation for large lots at mill is \$1.35 to \$1.40, the former figure being given in only exceptional cases. Small lots from store in New York are quoted at \$1.75 to \$1.80.

Chicago, by Telegraph.—The weakest sellers, who have latterly been demoralizing the market, have apparently been satisfied, and have now withdrawn from this market. Other manufacturers are consequently having a better trade and report plenty of inquiries. It may take a little time to recover from the very low level recently reached, but an effort is being made to stiffen factory prices to \$1.55, Chicago. Manufacturers have latterly been insisting strenuously on a good specification, refusing to sell low averages at the prices ruling. Car lots are quoted \$1.60, and small lots from stock \$1.65 to \$1.70.

Barb Wire.—This market is characterized by low prices, there having been as yet no recovery. The quotation of \$2.35 to \$2.40 for carload lots of Four-Point Galvanized fairly represents the market. The manufacturers are, however, disposed to refuse to make further concessions. The amount of business has been fair. There is an improvement in the export demand, and it is noted that higher prices prevail for export than for home trade. Small lots from store in New York are held at \$3.10 for Four-Point Galvanized or \$3 for carloads.

Chicago, by Telegraph.—Barb Wire manufacturers state that inquiries are now unusually numerous, indicating an active trade in the near future. They quote \$2.20 and \$2.65 for Painted and Galvanized Wire respectively, but jobbers are underselling slightly.

The court has ordered the receiver of the Joliet Enterprise Company to sell the stock of Wire on hand in lots to suit purchasers instead of disposing of it to the lowest bidder. It comprises about 2300 tons of Painted.

Home Tacks and Nails.—Atlas Tack Corporation, Boston, Mass., and 116 Chambers street, New York, are now putting on the market an assortment of Tacks for household use, which will be known to the trade as Home Tacks. These will be offered in different assortments and sizes. Each assortment is contained in a strong pasteboard box, very attractively gotten up, having a hinged cover, the top and front being tastefully printed in color. This box contains 12 smaller boxes, which

are intended to be retailed, each box containing six papers of Tacks, namely, one paper of 1-ounce Curtain and 3-ounce Gimp, two papers of 8-ounce Carpet, and one paper each of 10 and 12-ounce Carpet. A larger assortment consisting of 24 boxes is also put up, and other assortments containing Tacks and Nails will, it is expected, be out before long. The list prices for Carton No. 50, containing 12 small boxes, is \$3, and for Carton No. 100, containing 24 small boxes, \$6, subject to a discount of 50 per cent.

Shovels, Spades, &c.—The following is the revised price-list of A. M. Ross & Co., successors to Remington Agricultural Company, Ilion, N. Y. It is subject to a discount of from 40 and 5 to 50 per cent.:

Standard Square-Point Shovels.

No.	Size.	Black, Polished, per doz.	per doz.
No. 2.....	9½ x 11½	\$10.00	\$11.00
No. 2, light weight.....	9½ x 11½	9.75	10.75
No. 2, heavy ore.....	9½ x 11½	10.50	11.50
No. 3.....	10 x 12½	11.00	12.00
No. 4.....	10½ x 13	12.00	13.00
No. 4, heavy ore.....	10½ x 14	12.50	13.50
No. 5.....	11½ x 13½	13.75	14.75
No. 6.....	12½ x 14	14.25	15.25

Standard Round-Point Shovels.

No. 2, L. H.....	9½ x 12½	10.00	11.00
No. 2½, D. H.....	9 x 13	10.50	11.50
No. 3.....	9½ x 13	11.50	12.50
No. 3, heavy ore.....	9½ x 13	12.50	13.50

Standard Coal Scoops, Eastern Pattern.

No. 2.....	10½ x 14½	13.00	14.00
No. 3.....	11½ x 15	14.00	15.00
No. 3, light weight.....	11½ x 15½	13.50	14.50
No. 4.....	11½ x 16	15.00	16.00
No. 5.....	12½ x 16½	16.00	17.00
No. 6.....	13 x 17½	17.00	18.00

Standard Scoop, Western Pattern.

No. 6, wide mouth.....	13½ x 16½	17.00	18.00
No. 8, wide mouth.....	14½ x 17½	18.00	19.00
No. 0, wide mouth.....	15 x 18½	19.50	21.00
No. 2, wide mouth.....	15½ x 19½	21.00	22.50

Standard Coal Shovels.

No. 1.....	13 x 14	14.50	15.50
No. 2.....	14 x 14½	15.50	16.50
No. 3.....	14½ x 15	16.75	18.00

Standard Spades.

No. 2.....		12.50	13.50
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Their Economy Steel Snow Shovel, 4 or 4½ foot handles, 12½ x 16 inch blades, is listed, black, at \$7, and is subject to a discount of 33½ to 40 per cent. The Shovels half polished are 50 cents net per dozen extra, and with malleable D handles \$1 net per dozen extra.

Golden Crown Ware.—The following is the price-list of the Stuart-Peterson Company, Philadelphia, on their Golden Crown Ware, Tinned or Porcelain-Lined, with a new device for regulating heat under the vessel, of which a description was given in a recent issue. The list is subject to a discount of 60 per cent.:

GOLDEN CROWN WARE.

Flat-Rottom Round Boilers.

No.	List.	No.	List.
1, 2 Pints.....	\$0.80	17, 7 Quarts.....	\$2.05
3, 3 ".....	.94	19, 2 Gallons.....	2.20
5, 2 Quarts.....	1.05	21, 2½ ".....	2.60
7, 2½ ".....	1.14	23, 3 ".....	2.85
9, 3 ".....	1.22	25, 3½ ".....	3.35
11, 4 ".....	1.40	27, 4 ".....	3.60
13, 5 ".....	1.60	29, 5 ".....	4.20
15, 6 ".....	1.85	31, 6 ".....	5.67

Deep French Stew Kettles.

No.	List.	No.	List.
10, 3 pints.....	\$0.85	70, 4½ quarts.....	\$2.00
20, 2 quarts.....	1.00	80, 5 ".....	2.20
30, 2½ ".....	1.15	90, 6 ".....	2.50
40, 3 ".....	1.35	100, 7 ".....	2.80
50, 3½ ".....	1.60	110, 7½ ".....	3.10
60, 4 ".....	1.85	120, 8 ".....	3.85

Flat-Bottom Bellied Saucepans.

No.	List.	No.	List.
2, 1 Pint.....	\$0.65	20, 6 Quarts.....	\$1.85
4, 1½ ".....	.74	22, 7 ".....	2.05
6, 2 ".....	.80	24, 2 Gallons.....	2.20
8, 3 ".....	.94	26, 2½ ".....	2.60
10, 2 Quarts.....	1.05	28, 3 ".....	2.85
12, 2½ ".....	1.14	30, 3½ ".....	3.35
14, 3 ".....	1.22	32, 4 ".....	3.60
16, 4 ".....	1.40	34, 5 ".....	4.20
18, 5 ".....	1.60	36, 6 ".....	5.67

Deep French Stewpans.

No.	List.	No.	List.
1, 3 pints.....	\$0.85	7, 4½ quarts.....	\$2.00
2, 2 quarts.....	1.00	8, 5 ".....	2.20
3, 2½ ".....	1.15	9, 6 ".....	2.50
4, 3 ".....	1.35	10, 7 ".....	2.80
5, 3½ ".....	1.60	11, 7½ ".....	3.10
6, 4 ".....	1.85	12, 8 ".....	3.35

Flat-Bottom Oval Boilers.

No.	List.	No.	List.
1, 1 gallon.....	\$2.00	7, 4 gallons.....	\$4.35
2, 1½ ".....	2.35	8, 5 ".....	5.00
3, 2 ".....	2.75	9, 6 ".....	5.70
4, 2½ ".....	3.00	10, 7 ".....	7.50
5, 3 ".....	3.50	11, 8 ".....	8.85
6, 3½ ".....	3.85	12, 10 ".....	10.85

Fish Kettles.

No.	Inches long. List.	No.	Inches long. List.
1, 12 quarts, 16	\$3.75	4, 22 quarts, 22	\$6.70
2, 15 " 18	5.00	5, 26 " 24	9.30
3, 17½ " 20	5.84	6, 31 " 26	10.60

Oyster Cooker.

No.	Depth.	Diam.	List.
No. 1, 1½ quarts, 2½ in., 7½ in.			90c. each

The F. G. Patent Door Check.—This article is manufactured by Unity Door Check Company, 79 to 81 Dearborn street, Chicago. It is quoted at the following prices, which are subject to a discount of 50 per cent.:

	Each.
Tucker Bronze.....	\$0.50
Copper Bronze.....	.75
Black Bower-Barff.....	.75
Nickel Plated.....	1.00
Electro Bronze.....	1.00

Family Soldering Set.—A. S. Henn & Co., New Haven, Conn., for whom James P. Kenworthy, 96 Chambers street, New York, is agent, are putting on the market a Family Soldering Set which they call the Tinker's Dread, a description of which is given on another page. It is sold to the trade at \$1.50 per dozen or \$15 per gross.

Wrought-Iron Pipe.—Notwithstanding the fact that the demand for Wrought-Iron Pipe has been large, and the mills have been diminishing their output, prices are weak and irregular. During the latter part of last month they were lower than they had been for some time, and remain in substantially the same condition notwithstanding the efforts of the manufacturers to advance them. There has been some conference with reference to re-establishing the association with a view to an agreement as to the production and prices, but thus far without result.

Aluminum Cooking Utensils.—The Illinois Pure Aluminum Company, Lemont, Ill., issue a circular relating to their Aluminum Cooking Utensils, to which we have already referred. It calls attention to the advantages which Aluminum possesses for such purposes, the following points among others being emphasized: That under no circumstances can poison be extracted from Aluminum; that this material is three times lighter than the lightest metal used for Cooking Utensils; that it is almost equal to silver in its heat conductivity and is superior to other metals

in its retaining quality; and that Aluminum Cooking Utensils possess the advantages of porcelain-lined utensils without the annoyance connected with their use. The company also state that they are ready to purchase a used utensil of their own manufacture at scrap price, the price for scrap being given in the circular. Their price-list is as follows, terms net 30 days, 5 per cent. for cash on receipt of invoice:

	Per dozen.
1-quart saucepan.....	\$4.00
2-quart saucepan.....	8.00
4-quart saucepan.....	16.00
10-inch fry pan.....	
10½-inch wash bowl.....	4.80
13-inch wash bowl.....	

	Per half-dozen.
Tablespoons.....	\$1.50
Teaspoons.....	1.00

	Per pound.
Aluminum sheet of all gauges and widths carried in stock up to 18 B. and S. gauge and up to 12 inches wide, in lots of 50 pounds.....	\$1.00
From 18 to 24 B. and S. gauge and up to 12 inches wide, in lots of 50 pounds...	1.10

The circular also gives the scrap value of the goods as follows:

	Per dozen.
1-quart saucepan.....	\$1.20
2-quart saucepan.....	3.00
4-quart saucepan.....	6.00
10½-inch wash bowl.....	1.50

Wringers.—Colby Wringer Company, Montpelier, Vt., have adopted a system of discounts and quantity rebates on their Wringers applying to the following prices, which are subject to a cash discount of 2 per cent.:

The Colby Improved Wringer.

No. 3 Rolls, 10 x 1½ inches, per dozen...	\$36.00
No. 2 " 11 x 1½ " " "	42.00
No. 1 " 12 x 1½ " " "	48.00

The Premium Wringer.

No. 10 Rolls, 10 x 1½ inches, per dozen...	\$25.00
No. 11 " 11 x 1½ " " "	28.00
No. 12 " 12 x 1½ " " "	31.00

The company will be pleased to furnish information as to the discounts and quantity rebates on application.

Glass.—It is understood that application was made at Madison, Wis., during the past week for a charter for the National Glass Company of Milwaukee, but that the headquarters in Milwaukee will be merely one of sufficient formality to practically comply with legal requirements and preserve the charter. A meeting of the company is announced to be held at Chicago this week, when it is expected that the work of organization will be perfected and a full staff of officers and a board of directors elected. The company propose, as outlined by the press, to control their members by the penalty of forfeitures deposited, otherwise capital stock must be subscribed. The deposit, or stock subscribed, under the agreement will be forfeited if the regulations are violated by any member. Jobbers will also be admitted to the company. There has been no decrease in the number of pots in operation since the Glass factories started up last summer, for while many houses which were operating last fire are either idle at present or have gone out of business, there

has been more than a corresponding increase in new factories and in the capacity of old ones. It is reported that there are 1681 pots in operation, which is an increase over the number employed at any time during 1892.

Local trade in both American and imported Glass is quiet, though out-of-town trade is reported as fair. Prices in both lines are fairly well maintained, probably being somewhat stronger in anticipation of the successful organization of the National Glass Company. There are no new developments in the Plate Glass market. Prices remain unchanged, as follows:

American Window Glass, 1000-box lots or more, 80 and 15 per cent. discount; carloads, 80 and 10 per cent. discount; less than carloads, 80 and 5 per cent. discount. French Window Glass, 75 and 10 and 5 per cent. discount. American Plate ranges in price from 60 and 2½ per cent. discount to 60 and 5. Imported Plate Glass, 60 per cent. discount to 60 and 10 and 5 per cent. discount.

Export Notes.

THE COOMBS, CROSBY & EDDY COMPANY, 78 South street, New York, appreciating the fact that the Columbian Exposition soon to open at Chicago will attract many people from abroad, have conceived the idea of maintaining a headquarters in that city close to the grounds. Their purpose is to have a place where commercial friends from all over the globe may rendezvous and get reliable information indispensable to strangers far away from home. This will include such matters as hotel accommodation, means of getting about, what to see and how best to accomplish it, &c.

The establishment will be in charge of an efficient staff, including interpreters, recruited largely from their own force. U. D. Eddy of this company is now in Chicago perfecting the details of this enterprise.

The quicksilver mine in the State of San Luis Potosi, Mexico, has been shut down.

The Chilean House of Deputies has passed a law conferring power on the President to sell within three years the nitrate lands owned by Chili. Proposals are to be advertised for in London, Paris and Berlin. On motion of Deputy Tocornal an advertisement will be inserted in one New York paper, with a view to getting bids from American capitalists.

A financial crisis exists in Nicaragua. The Capital Bank is in process of liquidation and its Greytown, Rivas, Masaya and Chinandega branches have been closed.

The Venezuelan Government has entered into a contract for the establishment of a big shipyard at Puerto Cabello.

Yellow fever has broken out in Ecuador, and a Colombian quarantine has been established against that country.

A syndicate composed of Philadelphia capitalists is reported as having made extensive purchases of coffee plantations in the State of Oaxaca, Mexico.

Complaints have recently come to the Mexican Government from the frontier that articles manufactured in the free zone are subjected to duties when sent to the interior of Mexico, precisely on the same footing as similar goods of foreign manufacture. A report submitted to Finance Minister Romero, who had ordered a study made of the question, states that the measure alluded to is necessary to protect the manufacturing industries of the interior, which have to pay duties on raw materials, while the industries of the free zone get the raw materials free. The Minister is said to consider the free zone an anomaly and in published writings has declared himself against it.

Builders and Hardwaremen.

By a Merchant.

FIRST ARTICLE.

TWENTY YEARS AGO prices on Builders' Hardware were much higher than at present; and at that time there were but two or possibly three first-class manufacturers in the country making this line of goods. In New York City the control of this branch of the trade was then with an old-established house who received the orders in this line almost without solicitation. About this time I received my first lesson in Builders' Hardware, as in company with my old friend and employer, loaded with a variety of fine samples of compression bronze Hardware, of which Russell & Erwin Mfg. Company were the originators, we betook ourselves to the office of a gentleman who was erecting a very fine residence.

We spread the samples on his desk and tables and when the gentleman arrived, the unexpected display and the enterprise displayed in bringing our wares to his notice captured him by storm. An appointment was made to meet him at his new residence that afternoon, and before the day was over the order in all its details was ours.

DIFFERENT CONDITIONS.

How different we find the conditions of trade to-day; not that special energy and enterprise would fail of its reward, now as then, but it seems as though there were a 20-foot fence between the owner of a building and the unfortunate Hardware dealer who would like to sell his carefully selected goods to the man who is having a house built.

Approach the owner, and he is apt to tell you that the architect has full power of attorney, that he has specified the Hardware, and that if you desire to compete you will have to see the builder to ask him if you can give him a bid on the Hardware as specified. If the builder is not unwilling, the Hardware specifications are to be seen first. They are made by an architect

who is experienced in his branch of the business; but specifications, to be of value, must be made from samples submitted to the architect, and detailed by a Hardwareman. Otherwise the owner will not receive what the architect intends to have furnished for the building. As an illustration, the average specifications of architects mention brass face locks. The owner will get the so-called Competition lock with brass face, selling at about 23 cents each, while the architect intended to furnish a first-class lock with three tumblers, heavy brass face, steel keys, brass hubs, with the keyway milled, smooth wrought-steel tumblers, &c.

THE HARDWAREMAN'S POSITION.

The Hardwareman, if he is to get the order, is forced by the builder to figure on and furnish the cheapest competition goods, if he is rewarded with the order, answering to the requirements of the specifications. The owner finds out his mistake when too late; his doors are loose and lack the most necessary requirements—ease of movement and security against burglars. The dealer is the one who is condemned for the poor Hardware, though the builder has forced him to furnish cheap competition trash. To bring the high-grade Hardware into prominence and use the dealer should keep two distinct lines of goods—the competition line and a line of fine samples and some stock of modern art Hardware in its different patterns and finishes. The two lines of goods should be freely displayed at the store and shown to persons who are intending to build, explaining to them the difference between the two lines. In this way they will become interested in the stock and may be persuaded to order the architect to reserve the Hardware for them to select. The merchant is likely to have no difficulty when the confidence of the owner is once gained in pleasing him or in selling him a line of trimmings which will be a credit to the residence and to the merchant. The builder is not apt to resent this way of having the trimmings selected, for to him the selection of Hardware is an annoyance and usually a source of general disagreement between the owner and himself.

TREATMENT OF THE BUILDER.

Treat the builder as if he were a dealer, making him extreme prices on everything he buys, as in this line he certainly occupies the position of a dealer selling the goods again to others. He is entitled to a lower price than the owner if he buys for him. These general principles in the trade of Builders' Hardware settled upon, no further trouble will be had with the builder and none with the architect, whose preference usually is in the direction of having the owner select the Hardware.

NEW TROUBLES.

But alas! the Hardwareman's troubles are not at an end when even these points have been settled upon. Manufacturers of fine Builders' Hardware are conspiring at a distance to get away with the customer who has been weaned from the every-day

abuse of competition Hardware. Journals publish weekly lists of intending builders of houses, and from all points of the compass the customer is assailed by scores of letters from manufacturers inviting him to see their elegant samples of Hardware in modern patterns at this or that place. The building has perhaps not risen above the foundation before some of these enterprising firms appear on the spot, calling personally upon the owner, soliciting his order and showing their samples. There may be a dealer in the town who is a customer of the manufacturer, who having obtained the order will turn it over to the dealer for execution, the order, of course, including only the manufacturer's goods. Orders taken through others reflect no credit upon a merchant's business, pay no profit and do not move stock. Other dealers are somewhat afraid to solicit orders for fine goods themselves and will write to a manufacturer to send a man with samples of fine Builders' Hardware to take the order for them. They do not see the advantage they would gain by taking the order themselves, in pleasing their customers with a variety of goods selected by themselves from various manufacturers, some of whom excel in making one thing and some another. Our advice is to patronize no manufacturer who is not satisfied to deal with the trade rather than with consumers, and to sell no goods which you are not capable of handling yourselves. A business man with principles to which he is not willing to adhere, even at the risk of losing an occasional order, will not gain reputation and character in his business.

THE PLANS.

The merchant has to deal with the owner or the builder in furnishing Hardware for a building; and the latter is furnished with an estimate of the cost of the Hardware for the owner's house, upon the basis of competition goods. The following is given as an example of goods to be furnished, as shown by the plans. In the list is included everything necessary to hang the doors and windows of a house, except sash weights, sash cord, axle pulleys and nails. We find upon the plans, to be supplied with trimmings:

1 double front door, 2½ inch.

First Story Front.

2 single sliding doors, 2 inch.
1 double sliding door, 2 inch.
4 inside doors, 1½ inch.
1 single door to kitchen, double acting, 1½ inch.
6 windows.

First Story Rear.

4 inside doors, 1½ inch.
4 windows.

Second Story.

8 single doors, 1½ inch.
10 windows.

Attic.

4 windows.

Basement.

1 door to outside.
8 windows.

Closets, six.

THE SPECIFICATIONS.

The specifications read as follows:
Front door: Night lock, bronze trimmings.

Front part first story:

Solid bronze face locks and knobs with elongated escutcheons.

Bronze butts.

Bronze sash lifts, burglar-proof sash locks and pull down plates.

Rear part of first story and second story:

Bronze plated butts, locks and jet knobs.

Bronze-plated window trimmings.

Basement and attic: Common Hardware. Closets to contain 1 dozen C. and H. hooks.

Base knobs on all doors.

Three butts for all doors.

THE SCHEDULE.

Having ascertained the requirements, we prepare a schedule of Hardware required for this house, as follows:

Front Doors.

3 pairs No. M834A 5 x 5 butts.
1 only No. 726 front door lock, R. H.
1 flush bolt No. 36 each 12 and 24 inch.
1 No. M9160A push button.

First Story Front.

2 sets Lane's sliding door hangers, single.
1 set Lane's sliding door hangers, double.
2 No. M6963A single sliding door locks.
1 No. M6964A double sliding door locks.
4 sets No. 650 mortise locks, knobs and escutcheons complete.
6 pairs No. M834A 4 x 4 bronze butts.
1 pair No. 31 1½ inch Chicago spring hinges.
2 No. 831P push plates.
6 No. 113 sash fasts.
6 No. 800 sash sockets.
6 No. M842A sash lifts.

First Story Rear and Second Story.

13 pairs No. 7016 4 x 4 butts.
12 sets No. 9500 locks, jet knobs and escutcheons complete.
14 No. 109 sash fasts.
14 No. K442A sash lifts.
14 No. 200 sash sockets.

Attic and Basement.

1½ pairs No. 781 4 x 4 japanned butts.
1 set No. 9500 lock, knob and escutcheon complete.
12 pairs No. 838 2½-inch butts.
12 pairs No. 10 2-inch buttons.
6 dozen No. 113 C. and H. hooks.

We find the net cost of this bill of Hardware to be \$45, and we submit to the builder the following proposition:

We will furnish the Hardware for A. C. Hall's residence, complete, as per specifications, exclusive of cupboard trimmings, sash weights, sash cord, axle pulleys and nails, for \$50. This estimate is, however, subject to your immediate acceptance.

It is not improbable that the builder will say that he has been offered this Hardware by another firm for \$35, \$40, or from \$5 to \$10 below cost.

HOW THEY DID IT.

The other firm are not buying goods any cheaper than we are, but they have interpreted the specifications more loosely. They may have purchased a worthless inside lock at a low price, which we refused to buy; they may have omitted the front-door push button, because it was not specially mentioned, and they may have substituted a bronze-plated butt in front part of the first story instead of real bronze, according to specifications. We have never found a case where the architect insisted upon the removal of Hardware which was not up to specification. While in some cases the builder saves

some money in purchasing, the owner receives less value than he bargained for. Only irresponsible builders and Hardwaremen resort to such deception, but it makes it very unpleasant for those who want to do business as it should be done, and the only remedy is exposure of such tricks whenever discovered.

THE ADVANTAGES TO THE OWNER.

It is far better for the owner to select his own Hardware, as he has the advantage of the salesman's experience and his familiarity with the lines of goods produced by the various manufacturers. He may pay a small margin for such information as is imparted by the salesman, but the cost is small in comparison to the knowledge gained. With the samples spread out before the owner, he readily sees the advantage of a first-class burglar-proof lock, with keys working smoothly, over a competition lock, and has his attention called to the pleasing effects of the different finishes of metal upon the carefully selected woods for the various rooms. He notes the effect of Bower-Barff upon richly finished antique oak, of gold bronze on cherry, of old copper on natural oak for the hall, and he selects light oxidized silver for the sleeping apartments. The salesman carefully notes the taste displayed by the owner, and aids in the selection of patterns. After a short consultation the salesman suggests embodying the owner's ideas of finish and patterns on paper, as follows: For the outside of outside doors, Bower-Barff finish; for vestibule and hall, old copper finish, Urbino design; for parlor, Amherst design, gold plated; for library, Lyons design, No. B34 finish; for dining room, Plymouth design, light oxidized finish; for first story rear, Bower-Barff finish, plain design; for front hall, second story, Urbino design, old copper finish; for sleeping rooms, Lyons pattern, No. B34 finish; for bathroom, plain design, nickel finish, and for rear part of second story, plain Bower-Barff finish. These designs and finishes are mentioned merely by way of illustration, and others might, of course, be suggested.

THE WORK SATISFACTORY.

The work is completed and the owner is satisfied. The patterns and finish are impressed upon his mind, and he has decided upon the corresponding finish for chandeliers and other metal work for each room. His mind is at ease and he knows he will have three bolt locks on all doors opening to the rear and from bathroom, thus locking the rear securely from the front part of the house. All the details are worked out by the salesman, who now executes the order on paper, after which a schedule embodying every detail in the bill of Hardware is prepared. The owner knows what he may expect and what he pays for, and should the amount of the bill be too great, he can cut here or there, and the result will still be satisfactory and pleasing.

A. W. CHASE, 107th street and First avenue, New York, issues a price-list on Lake Superior stone, which is subject to a discount of 10 per cent.

Competition.

A CORRESPONDENT, mentioning the remarkable volume of business which has been done during the past month when the weather has been such as to put a stop to outdoor work, refers in the following terms to the energy of manufacturers and jobbers and the advantage which the smaller trade are deriving from their competition:

Whether it is the ever-abounding energy and push of the jobber who buys goods cheaper and cheaper, and so has something constantly attractive to offer to his customers, or what it is, is hard to say. Certainly the country merchants, that is, the general stores, have enjoyed an extraordinary winter trade. Heavy clothing, boots, &c., have not been called for so readily in several years; and generally the patrons of these dispensaries of the necessities are able to pay well for them. The vigorous competitions among the manufacturers are gradually telling beneficially on the country folks, but at the same time such evidences of advancement and civilization create so varied a taste and desire that it is questionable whether the common people are really more to be envied than their predecessors.

Certainly if inducements in the way of low prices can cause a year of general improvements, then the buildings, fences and farms generally should show a new era this spring. The prices that are ruling from the mills and factories will soon get to the retailers, for the jobbers are proverbially unselfish in vieing with each other in giving the poor retailer the benefit of some confidential price made them. Perhaps just here each big dealer well knows that his next neighbor in the trade has the same kind confidence bestowed on him too. Well, if he has, then the poor country merchant is doubly blessed. It is reasonable, however, that when all the country stores get the same tip from their big city cousins the actual consumers, the farmers and laborers, the city workingmen and mechanics should get some of the advantages too.

Decision in Mr. Shapleigh's Favor.

SOME TIME SINCE suit was begun in the United States District Court for the Eastern District of Missouri by the United States against Frank Shapleigh, vice-president of the A. F. Shapleigh Hardware Company, St. Louis, to recover judgment against him for \$425,771.34. The petition alleges that Mr. Shapleigh secured the contract to make some repairs at Jefferson Barracks during the years 1883, 1884, 1885 and 1886. The Government claimed that the contractor secured during this time payment on vouchers for work which was never performed, and that by these violations to have sustained damages in the sum of \$56,885.67, and in accordance with the provisions of the statute demanded judgment against Mr. Shapleigh for double this amount and also \$312,000 in penalties, making an aggregate of \$425,771.34.

The case was tried in the lower court by a jury, which returned a verdict for the defendant. The Government carried up the case, but the judgment of the lower court was affirmed, and the case, the trade will be pleased to learn, was decided in favor of Mr. Shapleigh.

The Standard Horse Shoe Company.

THE STANDARD HORSE SHOE COMPANY, Boston, Leeds, Robinson & Co., 75 North street, general agents, who have recently put their goods on the market, are making a line of front and hind Shoes in extra light, light, medium, heavy and light steel. The Shoes are made upon new and improved machinery, giving, it is explained, a correct shape to the Shoe and a uniform distribution of material. The manufacturers remark that, considering the quality of iron and steel used, the shape of the Shoe, the mode of manufacture and extreme care taken from the selection of the material to the perfect Shoe, their product is worth the examination and attention of the trade. The company have but recently put their Shoes on the market, but we are advised that they will have for spring trade a full line of sizes and weights.

Hartman Mfg. Company.

THE HARTMAN MFG. COMPANY of Beaver Falls, Pa., have made a change in their directory by which C. R. Wylie, who since the inception of the company has been the secretary and treasurer, and for a year past the general manager, retires from connection therewith. Mr. Wylie disposed of his interest to H. W. Hartman, president of the company, and is now enjoying a brief vacation at his former home in Pottstown, Pa. Mr. Wylie left college some seven years ago and obtained a situation in the shipping department of the old Hartman Steel Company of Beaver Falls, now a branch of the Carnegie Company. This was during the presidency of Henry W. Hartman. When the latter gentleman retired from the company mentioned, and organized the Hartman Mfg. Company for the purpose of carrying on the steel picket fence and flexible wire mat business, he offered Mr. Wylie the position he has just resigned and which he so efficiently filled. For the present A. T. Brook, New York City agent of the Hartman Mfg. Company, is acting as secretary, and Fred. Ransom, who has held the position of assistant treasurer and cashier of the company, is filling the position of treasurer. There has also been a change in the Chicago office of the company. T. D. Ganse, who has filled the position of general Western sales agent, having retired from this position and removed to his stock farm in Marshall, Mich., F. S. Atherton, who has been employed as selling agent by the Hartman Mfg. Company for a number of years past, has been promoted to the position vacated by Mr. Ganse. Mr. Hartman, president of the company, who is also president of the Pittsburgh Company, owners of the new manufacturing suburb of Pittsburgh, Ellwood, Lawrence County, contemplates the speedy removal of the works of the Hartman Mfg. Company from Beaver Falls to Ellwood. The new factory buildings of the company at Ellwood are already erected and the change will probably be made the coming spring. Seven large manufacturing establishments have, we are advised, removed their plants to Ellwood during the past six months.

HENRY ADLER, 322 W. Forty-first street, New York, issues an announcement to the trade to the effect that on January 6 Judge Wheeler rendered a decision that the patent on the Globe Ventilator is not infringed by the World Ventilator. Charles D. Lawrence, inventor of the World Ventilator, is associated with Henry Adler in its manufacture.

PRIZE COMPETITIONS.

WE HEREBY ANNOUNCE a series of six prize competitions relating to trade matters in which our readers are interested. Four prizes of \$50, \$25, \$15 and \$10 will be awarded in each competition.

The competitions are open to all and a general participation on the part of the trade is invited.

We shall have the privilege of publishing any or all of the contributions received.

The committee of award in assigning prizes will take into account the merit of the different contributions and their suitability for publication.

PRIZE COMPETITION No. 6.

How Retailers Can Best Advertise and Extend Their Business.

The object of this competition is to obtain practical suggestions as to the methods which the retail dealer in Hardware, Stoves, Tinware, &c., can advantageously adopt in building up his business, and is intended to cover such points as the following:

- Advertising in the local papers, with suggestions as to how such advertising should be done and to what extent;
- The manner in which circulars and other printed matter may be used;
- A description of any special or unusual methods of attracting and holding trade; and
- General suggestions in regard to ways in which the business can be extended.

An account of any methods which have been found useful in building up trade will be suitable under this competition.

First Prize.....	\$50.00
Second Prize.....	25.00
Third Prize.....	15.00
Fourth Prize.....	10.00

This competition will be open until the close of business February 18, 1893.

Contributions should be addressed to David Williams, 96-102 Reade street, New York, and marked Prize Competition No. 6.

PRIZE COMPETITION No. 7.

Travelers' Yarns.

The traveling salesman is proverbially happy in the stories which he narrates, and this competition is for the purpose of calling out a collection of good yarns for publication. While the attention of travelers is specially invited to this competition, it is open to all. Stories relating more or less closely to trade or business matters will be preferred.

First Prize.....	\$50.00
Second Prize.....	25.00
Third Prize.....	15.00
Fourth Prize.....	10.00

This competition will be open until the close of business February 18, 1893.

Contributions should be addressed to David Williams 96-102 Reade street, New York, and marked Prize Competition No. 7.

PRIZE COMPETITION No. 8.

How to Treat Clerks.

Under this competition, beside a general discussion of the subject, such questions as the following may be considered:

- The extent to which clerks should be given an opportunity of obtaining a knowledge of the business, and of price-lists, prices, &c.;
- Whether it is desirable to have formal rules for the regulation of employees and for the management of the store. If so, a set of rules should be submitted;
- To what extent clerks should be held responsible for their mistakes;
- Suggestions as to how clerks should be treated in order to secure their most intelligent and efficient work;
- Mistakes made in the treatment of clerks.

This competition opens an important subject and it is hoped that it will be discussed fully by merchants and by their clerks from their different points of view.

First Prize.....	\$50.00
Second Prize.....	25.00
Third Prize.....	15.00
Fourth Prize.....	10.00

This competition will be open until the close of business February 18, 1893.

Contributions should be addressed to David Williams, 96-102 Reade street, New York, and marked Prize Competition No. 8.

PRIZE COMPETITION No. 9.

Shop System of Keeping Track of Jobs.

This competition is intended to call out information in regard to methods of keeping account of the cost of labor and material on tin-shop work, repairing and new work, inside and outside. In connection with the general subject such points as the following may be touched upon:

- Whether blanks or forms are used in connection with such work. (If so, samples should be submitted);
- What record is kept of orders, costs of jobs, charges, &c.;
- How time occupied in going to and from the job is covered;
- Suggestions in regard to the profitable conduct of the shop.

To illustrate the system it is desirable that a specific job (as for example, repairing down spouting and eave trough, or other job of repairing in which new material is used) be referred to and the method of keeping track of the costs in such job fully explained.

First Prize.....	\$50.00
Second Prize.....	25.00
Third Prize.....	15.00
Fourth Prize.....	10.00

This competition will be open until the close of business February 18, 1893.

Contributions should be addressed to David Williams, 96-102 Reade street, New York, and marked Prize Competition No. 9.

PRIZE COMPETITION No. 10.

Business Maxims—At Least 10.

Those entering this competition will send at least ten maxims relating to the conduct of business, presenting in a brief and pithy manner practical suggestions which may advantageously be followed.

First Prize.....	\$50.00
Second Prize.....	25.00
Third Prize.....	15.00
Fourth Prize.....	10.00

This competition will be open until the close of business February 18, 1893.

Contributions should be addressed to David Williams, 96-102 Reade street, New York, and marked Prize Competition No. 10.

PRIZE COMPETITION No. 11.

How Small Retailers May Keep a Record of Prices.

The object of this competition is to call out information or suggestions in regard to the best methods to be adopted in keeping a record of prices, showing cost or selling prices, or both cost and selling prices, of Hardware, Stoves, Tinware, &c., in a small retail store employing not more than four persons in the selling and bookkeeping departments, including the proprietors. Those entering the competition are expected to give a concise and clear explanation of their system, and if a price book is used, to submit as illustrating the system at least three specimen pages. If a price book is referred to it may be of any design or arrangement best adapted to the purpose, and may be original with the contributor or may be one of the different price books on the market. Fictitious names should be used instead of the real names of jobbers and manufacturers.

The committee in awarding prizes will take into account the merit of the different systems described, the character of the descriptions given, and the general utility and interest of the contribution.

First Prize.....	\$50.00
Second Prize.....	25.00
Third Prize.....	15.00
Fourth Prize.....	10.00

This competition will be open until the close of business, February 18, 1893.

Contributions should be addressed to David Williams, 96-102 Reade street, New York, and marked Prize Competition No. 11.

Henry E. Russell.

HENRY E. RUSSELL, President of the Russell & Erwin Mfg. Company of New Britain, Conn., and New York, died at his residence, 55 East Sixty-eighth street, in this city, Thursday, January 26, after a brief illness, in the seventy-eighth year of his age. Mr. Russell was born in Litchfield, Conn., April 16, 1815, and attended school until he was 11 years of age, when the family removed to New York. He then entered his father's store, where he remained until he was 16, when he took a position in a retail Hardware store in Maiden lane, but soon afterward entered a wholesale house in the same line, with which he remained until the close of 1838. On January 1, 1839, he removed to New Britain, Conn., and entered into business connection with the firm of Stanley, Woodruff & Co. He remained with this concern through its many changes, until 1851, when the Russell & Erwin Mfg. Company were organized, and Mr. Russell was elected treasurer and secretary. He held the position of treasurer of the company until the death of its former president, Cornelius B. Erwin, which occurred several years ago, when Mr. Russell was elected president, a position which he held at the time of his death, and was at that time the sole survivor of the original founders of the corporation which in part bears his name. He has been prominently connected with the manufacturing industries of his native State, not only through his own company, but as director and officer in various other corporations located in New Britain, Waterbury, Meriden, Bridgeport and Hartford. He has been known as a man of great energy and industry, and, in his various business relations, of kindly heart and disposition. He accumulated a fortune in the returns of the various industries with which he was connected, and dispensed his wealth with a liberal hand to deserving charities. He was at his death a member of St. Thomas' Church of this city. The funeral services were held

on Tuesday, January 31, at 10 A.M., and his remains were interred in Woodlawn Cemetery.

Trade Items.

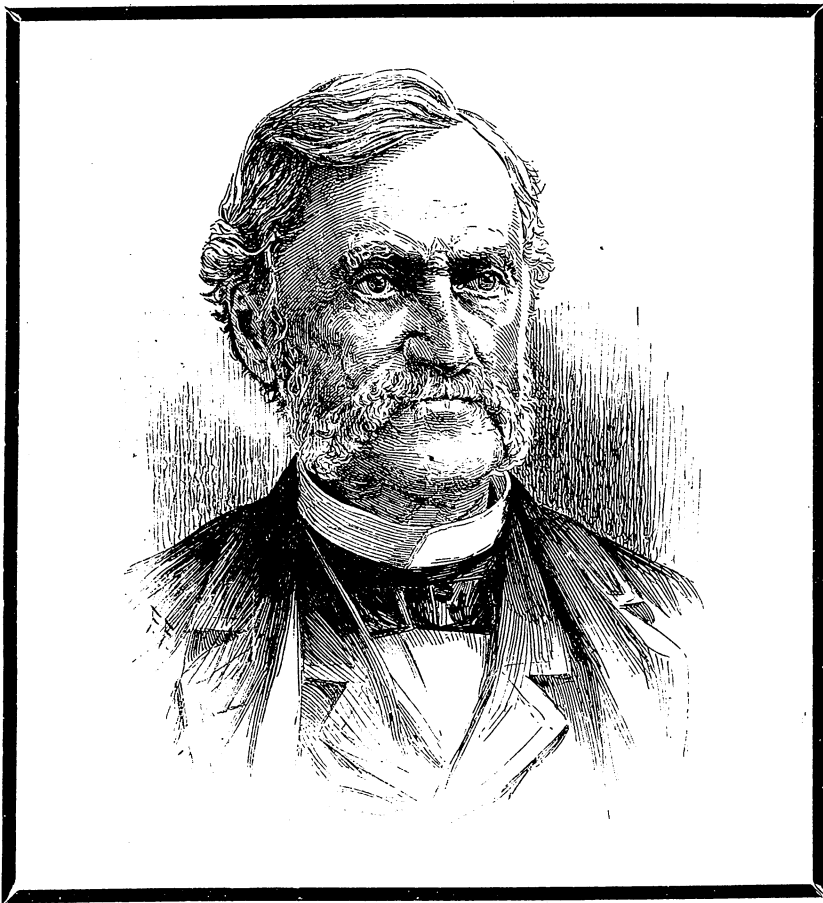
THE FIRM of Logan, Gregg & Co., Hardware dealers, of Pittsburgh, has been dissolved by the retirement of Mrs. Clara A. Gregg. The remaining partners, Geo. B. Logan and Thomas A. Parke, will continue the business under the same firm name, assuming the liabilities and receiving the debts of the old firm. Within a few weeks Logan, Gregg & Co. will remove to their large new building on Seventh street below Penn avenue, Pittsburgh, where they will be pleased to see all their friends and customers.

ANOTHER HORSESHOE PLANT has been started in the West, known as the Eagle

by Frank L. Brown, who has been appointed Pacific Coast agent, with office and warehouse at 8-10 Pine street, San Francisco. Mr. Brown was for a number of years the secretary of Staver & Walker, and more recently of Mitchell, Lewis & Staver Company, of Portland, Ore., and is thus referred to as fully acquainted with the needs and requirements of a large portion of the trade of the Pacific Coast. The company also state that they will continue to carry a large and well assorted stock of all kinds of Wire at San Francisco, Sacramento and Portland.

OUR READERS will observe the announcement in our advertising columns in which the Mann Edge Tool Company, Lewis-town, Pa., express their desire to receive orders for Axes of all kinds. They state that their factory is fully equipped with the best facilities and that they are entirely independent of any trust or combination,

their brands being distinctly different. They do not expect to compete with makers of inferior goods, but mention that they are in a position to produce the highest grade of Axes at the lowest possible cost. The Mann Edge Tool Company have been incorporated under the laws of Pennsylvania with a paid-in capital of \$60,000. Their plant is new and complete, with a capacity of 20,000 dozen Axes per annum. The buildings comprising the plant are of brick, with water power, and the receiving and shipping facilities are so convenient that no carting is required. The officers of the company are as follows: Joseph R. Mann, president; William Willis, vice-president; S. B. Weber, treas-



HENRY E. RUSSELL.

Horseshoe Works. The company have just built a factory at South Milwaukee, Wis., which is a growing manufacturing suburb of Milwaukee.

THE GRAND CROSSING TACK COMPANY, Grand Crossing, Chicago, have erected a new building two stories high, 50 x 30 feet, for the purpose of increasing their packing facilities, now being able to turn out 500 gross of Claw Handle Carpet Tacks per day. Everything is in full operation, and the demand is rapidly increasing for the company's products.

WASHBURN & MOEN MFG. COMPANY, Worcester, Mass., issue a circular, under date January 18, in which they announce that George A. Cragin, formerly their agent at San Francisco, has taken charge of their interests in the State of Texas, with headquarters at Houston, where the company have for some time had an office and warehouse. Mr. Cragin will be succeeded

by Robert Mann, Jr., secretary and superintendent. These persons, with Jacob Muthersbaugh, J. Alden Knight and B. J. Selheimer, comprise the board of directors. The management of the business is in the hands of Joseph R. Mann, formerly of R. Mann & Sons, and late general superintendent of the American Axe & Tool Company, and of Robert Mann, Jr., formerly of Thomas R. Mann & Co., and late superintendent of that factory under the American Axe & Tool Company.

JOSEPH BRECK & SONS, Boston, have been incorporated under the laws of the Commonwealth of Massachusetts, with a capital stock of \$125,000. They have succeeded to the assets and good-will of the former firms of C. H. Thompson & Co., established in 1853; Parker & Wood, established in 1845, and Joseph Breck & Sons, established in 1822. The officers of the corporation are as follows: Charles H.

B. Breck, president; Charles H. Breck, treasurer; Joseph F. Breck, secretary; Edward O. Hatch, general manager, and Archibald Smith, manager of Seed Department. The new firm have remodeled and enlarged the different stores at 47 to 54 North Market street, 46 Merchants' Row, and 17 to 19 North street, Boston. They state that they have adopted the best methods of the firms to whom they are successors, secured the services of their most experienced and efficient employees and greatly reduced their running expenses, thus putting them in good position to fill all orders for the most improved Implements and Machines, Seeds, &c., at the lowest prices. Edward O. Hatch, the general manager of the concern, was formerly the active member of Parker & Wood.

THE IRON CLAD MFG COMPANY, 22-24 Cliff street, New York, inform us that although they have added materially to their facilities in the way of presses and machinery, and have lately doubled the capacity of their plant over last year, making it three times as large as two years ago, they are being pushed to execute their orders. They refer to trade as very good, and add they are now making a large line of Stamped and Pieced Enameled Ware, to which they are continually adding in the way of new goods.

ANNOUNCEMENT IS MADE that the firm of P. Wilson's Sons & Co., manufacturers of Chains, Saddlery Hardware and Wood Hames, Cincinnati, Ohio, have discontinued business. The E. Besuden Company have purchased the entire Chain department formerly operated by P. Wilson's Sons & Co., and by the aid of new and improved machinery will be able, they state, to manufacture a superior quality of Coil, Wagon, Trace, Railroad and all varieties of Chain at prices satisfactory to the trade.

VITRIFIED WHEEL COMPANY, Westfield, Mass., have opened a Chicago branch at 55 South Canal street, where they will carry a stock of their product. The store is in charge of G. H. Walker.

HAYDOCK & BISSELL, 12 Murray street and 15 Park Place, New York, among the Special Notices in this issue announce a large trade sale of Cutlery on Wednesday, Thursday and Friday, February 8, 9 and 10, particulars in regard to which are given. This is the opening Cutlery sale for 1893, and is an important one for buyers of Cutlery to attend, as all the goods will be sold without reserve in quantities to suit the jobbing and retail trade.

F. E. MYERS & BRO., Ashland, Ohio, have contracted with the Crane & Ordway Company, St. Paul, successors to the Crane Company and Rogers & Ordway, for a large number of Myers' Glass Valve Seat Well and Tank Pumps. F. E. Myers & Bro. desire to refer all dealers in Minnesota and North and South Dakota to the Crane & Ordway Company as their exclusive agents, who, freights considered, are in a position to supply the trade at satisfactory prices and terms. F. E. Myers & Bro. advise us that four carloads of these goods have already been ordered by Crane & Ordway Company, who will carry a stock which will meet the large requirements of their territory.

THE DISCOUNT SHEET of Stanley Works, New Britain, Conn., and 79 Chambers street, New York, bearing date January 2, has recently been issued. It gives revised quotations on their large and varied line of goods, calling prominent attention by means of asterisks to changes in price. These are principally on Wrought Butts, a new list having been adopted since the former discount sheet was issued. The company also state that they are prepared to furnish their Wrought Steel Butts, Flush Bolts, &c., in the following finishes

at the annexed percentage of advance over the price of the corresponding goods in electro plate bronze:

Finish.	Description of finish.	Percentage of advance.
A, Ordinary Light Bronze	0
A 1, Reddish Bronze, approaching Copper	0
B, Dark Bronze	0
C, Ordinary Brass	0
D, Old Copper with a high luster	25
D 1, Old Copper, dark around edges, red in center	25
D 2, Old Copper, the dark oxide and red Copper in patches	25
D 3, Old Copper, the dark oxide and red Copper in patches, darker than D 2	25
E, Oxidized Silver, light	50
E 1, Oxidized Copper or Steel Blue, all one shade	20
E 2, Oxidized Silver, dark around edges and joint, darker than E finish	50
E 3, Oxidized Silver, light and dark in patches	50
F, Old Brass, dead finish, all one shade	20
F 1, Antique Brass, oxidized, giving a steel blue and brass effect	25
F 2, Antique Brass, yellow and brass shaded	25
G, Bower Barff	..... Net prices on application.	
H, Dead Black electro plate	20

AMONG THE SPECIAL NOTICES in this issue is one in which the position of vice-president and business manager in a well-established Western Stove company is referred to as open to a properly qualified person who is prepared to take a one-sixth interest in the concern. It is stated that the salary, commission and bonus will make the position worth between \$8000 and \$10,000 a year. Communications in regard to the matter are to be addressed to Francis R. Wardle, 3 and 4 Times building, New York.

THE WORKS of the Wentworth Spring & Axle Company, Gardiner, Me., have again suffered partial destruction by fire. The insurance has been adjusted and the company are energetically engaged in rebuilding. They advise us that in less than a month they will be turning out their regular high-grade Axles, including the Richards Automatic Lubricating Acme, and with better facilities than heretofore.

THE S. A. HAINES COMPANY, Indianapolis, Ind., have been appointed selling agents for the products of the Britton Iron & Steel Company, Cleveland, Ohio.

HUNTER ARMS COMPANY, Fulton, N. Y., advise us that during last year they sold more high grade Guns than ever before, and allude to this fact as indicating that the trade appreciate their efforts to supply them with a good Gun. They refer to nitro powders as being now so largely used that it is very desirable that sportsmen should look well to the simplicity of the Gun they purchase in order that it may stand the strain, and state that the L. C. Smith Gun which they are making is guaranteed to stand these powders.

J. M. STUTZMAN, 181 William street, New York, engraver and die sinker, refers to the fact that he has been actively engaged in business at the above address for the past 12 years making, he states, a fine quality of such goods as are in his line, including Steel Stamps, Alphabets and Figures for stamping Steel, Copper and other metals, Die Letters for Steel engravers, Stencil Cutting Dies, Steel Dies for embossing Tin boxes, lard pails, &c. Also Burning Brands, Seals, Soap Molds, post office canceling Stamps, Door and Machine Plates and music engravers' tools. He alludes to trade as being at present in a very satisfactory condition.

THE COPARTNERSHIP heretofore existing between L. E. and L. L. Morey, under the name of Morey Hardware Company, Vandalia, Ill., has been dissolved by mutual consent. The business will be continued by L. E. Morey, who has assumed the lia-

bilities and to whom all notes and accounts are to be paid.

THE INCORPORATION is announced of the Connecticut Screw Company, Waterbury, Conn., with a capital stock of \$5000. They will manufacture a line of Screws, Rivets, &c. The subscribers to the stock of the company are. S. F. Taylor, J. M. Gallond, Lucien R. Hitchcock and Robert F. Griggs of Waterbury, John F. Ottrogge of Brooklyn, N. Y., and Robert H. McNall of Greenwich, Conn.

J. J. KELLY, Benwood, W. Va., dealer in Hardware and Cutlery, has just added Stoves and Tin and Granite Ware to his line. Mr. Kelly states that he would be glad to see any jobbers' representatives that may call upon him.

IN THEIR ADVERTISEMENT, occupying page 109 of this issue, Brittan, Graham & Mathes, Pittsburgh, Pa., direct the attention of the trade to the large line of Door Locks, Padlocks, Knobs and Butt Hinges which they are now manufacturing. Announcement is made that catalogues of the above goods will be sent to the jobbing trade upon application.

THE MALLORY WHEELER COMPANY, 64 Reade street, New York, are remodeling their store in this city and will now occupy almost all of it, their former tenants, who have heretofore shared the space with them, having removed to other quarters. The offices will be in front, and adjoining there will be an exhibition room containing working models of Locks, Knobs, &c., mounted in the various hardwoods. Drawers will be provided for holding sample boards, which may be inspected by pulling the drawer out or the board may be removed for closer inspection. In the future a stock better suited to the needs of trade in this vicinity will be carried. Russell Hotchkiss, vice-president of the company, now has charge of the sales, headquarters in New Haven, while William G. Hill, for many years with Sargent & Co., New York, will manage the branch in this city.

I. H. AMOS, who is widely known to the trade of the Northwest from his connection with Foster & Robertson, Portland, Ore., is now devoting his attention to representing Eastern manufacturers, and has established his office in West Block, Rooms 52 to 55, in that city. He has already made arrangements to represent the following among other well-known manufacturers: Kieckhefer Bros. & Co., Milwaukee, Wis.; Lamson & Sessions Company, Cleveland, Ohio; Falcon Iron & Nail Company, Niles, Ohio; Mann Edge Tool Company, Lewistown, Pa., and St. Louis Shovel Company, St. Louis, Mo. Mr. Amos will visit the larger trade in Montana, Idaho, Oregon, Washington and California. He is now in the East concluding negotiations with other manufacturers of leading lines who are intending to avail themselves of this opportunity of having their goods efficiently represented in the Northwest.

BRITTAN & BOND, 154 Lake street, Chicago, are representing the Duffy & Lovelock Tool Company, who are manufacturing a line of fine Steel Tools. It is their aim to offer the very best Steel Tools made, and all goods marked Duffy are fully warranted. Their line includes Vest-Pocket Berry-Box Openers, Hip-Pocket Crate Openers, Boot and Shoe Dealers' Case Openers, Cigar-Box Openers, California Fruit-Case Openers, Duffy's Wine-Case Openers, Concrete Tools, the Chicago Gate Hinge, Cabinet Makers' Bench Hooks, Bricklayers' Hammers and Chisels, Cold Chisels, Punches, Tinnerns' Chisels, Tinnerns' Punches, Hand Groovers, Rivet Sets, Blacksmiths' Cutters and other Tools. Their 1893 catalogue illustrates these goods with descriptions and prices.

THE AMERICAN BIT BRACE & TOOL COMPANY, Buffalo, N. Y., employing new methods and new materials under new management, call special attention to quality of their Steel Jaws, Chucks and Ratchets, and to the unexcelled workmanship of their goods. They are putting new styles of Braces on the market, including a cheap Bit Brace with steel sweep, malleable nut, socket and quill, anti-friction ferules, heavy jaws, genuine cherry head and handle. This Brace is made to meet competition on low grades. They issue a list, without prices, of their Braces, conveniently arranged, showing at a glance the assortment of goods made by them. Information regarding their guarantee and other interesting facts will be found in their advertisement in this issue.

UNITY DOOR CHECK COMPANY, 79-81 Dearborn street, Chicago, are manufacturing the F. G. Door Check. It is designed to fasten to the bottom of the door, and combines the desirable qualities of check, bolt and bumper. It has a rubber foot which acts as a bumper and saves the wall from the knob, but does not wear the floor or carpet. The check is set and released with the foot without stooping, and can be set as a dead lock at night, so that it cannot be picked or forced without breaking the door. A pamphlet illustrates the check and gives description of it, with directions for its use.

FROM THE CLEVELAND STONE COMPANY, Cleveland, Ohio, we have a leather bound vest pocket memorandum book, with an 1893 calendar on the inside of the back cover. On the inside of the front cover are given interesting facts regarding the company as follows: The Cleveland Stone Company employs over 2000 men, and their plant includes 142 derricks, 130 steam hoisters, 64 boilers, consuming 28,000 tons of coal per annum; 69 steam engines, 40 channeling machines, 55 steam drills, 37 steam pumps, 36 grindstone turning lathes, 78 gangs of saws, and have a capacity of 200 cars per day.

THE HARDWARE FIRM of Tatnall & Dorsey, Piedmont, Ala., have been dissolved by the withdrawal of S Thompson Dorsey. J. Latimer Tatnall will hereafter conduct the business under the style of the Tatnall Hardware Company.

J. E. McDANIELS of the Norton Iron Works, Ashland, Ky., will on February 1 become connected with Hyatt, Mathews & Co., agents for Iron and Steel, Cincinnati, Ohio. Mr. McDaniels has had several years' experience in Iron and Steel in his connection with the Norton Iron Works, and is referred to as an energetic young man with a large acquaintance among Iron men.

THE H. B. SAHLER FURNITURE & CARPET COMPANY, Atchison, Kan., have purchased the stock of Hardware, Stoves, House-furnishing Goods, Tinware, &c., formerly carried by Herman Jochems of that city.

THE TRADE WILL OBSERVE the double-page advertisement of Lansing Wheelbarrow Company, Lansing, Mich., which will be of special interest at this time as giving illustrations of some of their leading patterns of Wheelbarrows and also of their Trucks and Hand Cart. Some of the special features of these goods are also pointed out.

A. C. BARTLETT, vice-president of Hibbard, Spencer, Bartlett & Co. of Chicago, arrived in New York on the 18th inst., and was greeted in Chicago by his old associates on the 21st. His reception was a very hearty one, all the warmer as they observed that he had very greatly improved in health during his sojourn abroad of the past year and a half. At the recent annual meeting of this company the number of

directors was increased from five to seven. The directors elected for the ensuing year are as follows: Wm. G. Hibbard, A. C. Bartlett, C. H. Conover, E. G. Clark, H. J. Sawe, Joseph J. Charles and A. M. Graves. The last two named are new men on the board, but have been connected with the house for a long time. Mr. Charles in the capacity of buyer and Mr. Graves as house salesman and in charge of traveling salesmen.

BURN STAMPING & MFG. COMPANY, 66 Lake street, Chicago, advise us that they are producing all their own Steel Plates used in the manufacture of milk cans and also Roofing Plates 20 x 28 inches.

J. L. STICHTER & SON, Reading, Pa., have disposed of their store and good will to the Stichter Hardware Company, Limited, who will continue the business at the old stand, where the retailing of Hardware was first commenced in 1789. J. L. Stichter had possession for over 50 years. In 1872 Thomas D. Stichter, his son, was taken into partnership with him under the style of J. L. Stichter & Son. The latter continued with the firm until his death, which occurred in July last. The members of the Stichter Hardware Company are the heirs of J. L. and T. D. Stichter.

C. M. AVERY, Somerton, Philadelphia, Pa., has recently made arrangements with the Portsmouth Wrench Company, Boston, to represent them to the trade in connection with the other manufacturers represented by him.

IN THEIR ADVERTISEMENT in this issue Burditt & Williams, 20 Dock square, Boston, illustrate the genuine Marty Rat and Mouse Trap, which they are putting on the market in this country as sole agents and importers. They call attention to the fact that they have a large fresh stock of the Traps ready for immediate delivery.

GEORGE COLLISTER, who has had charge of the Bicycle department of Davis & Hunt, Cleveland, Ohio, for ten years, has accepted the position of general sales agent for the Winton Bicycle Company, Cleveland. Mr. Collister is an active member of the Racing Board of the League of American Wheelmen, and is one of the best known bicyclists in the country.

THE IOWA FARMING TOOL COMPANY, Fort Madison, Iowa, have recently completed a two story brick building, 42 feet by 70 feet, to be used for a machine shop finishing department. They have also built a new brick boiler house, and placed in it a new 250 horse-power patent Heine boiler. They have, in addition to the above, under contract, a new four-story warehouse, 50 feet by 150 feet, to be used for the storage of goods, which will be so arranged as to allow them to load goods direct into the car. Their trade during the year 1892 was unusually heavy, and they are looking forward to a good spring trade, and are making preparations to be in shape to meet it.

WE ARE REQUESTED by F. E. Kohler & Co., Canton, Ohio, to caution the trade against a person calling himself E. C. Bishop from Chicago, who claims to be traveling for them and has a few of their samples. They state that he is not authorized to make collections for them and is not in their employ.

THE ST. JOSEPH PUMP COMPANY, St. Joseph, Mo., manufacturers of the well known Perfection Water Elevator and Purifying Pump, favor us with a copy of their calendar for 1893. The calendar proper is mounted on heavy cardboard back, the upper portion of which contains an attractive picture in light blue, showing three interesting children in the act of using one of this company's Pumps. The lower part is devoted to the calendar proper, comprising 12 calendar sheets.

Some advertising matter is placed on the front of the calendar, but not enough to mar its beauty. A silken cord is attached for the purpose of hanging the calendar.

THE COLUMBIAN MFG. COMPANY, Cincinnati, Ohio, in their advertisement in this issue illustrate the Columbian joist leveler which they are putting on the market. This article is intended, as its name indicates, for rapidly adjusting and leveling joists, beams, girders, &c., of any size, and it is claimed by the manufacturers that it will not slip or turn, and remains upright at all times.

THE WITTE HARDWARE COMPANY, St. Louis, Mo., have been appointed agents for the product of the Eau Claire Refrigerator Company of Eau Claire, Wis. The Witte Hardware Company will carry in stock a full line of these goods, which include Household Refrigerators, Ice Chests, Grocers', Hotel and Butchers' Sectional Refrigerators, Side Board Refrigerators, &c. These Refrigerators are made with mineral fiber filling and cleansible flues.

R. CHRISTENSEN, 90 Chambers street, New York, alludes to the fact that he is the only jobber of Cabinet Hardware carrying a stock in the lower section of the city. The coming spring will complete the first ten years of his establishment in this vicinity. He was for many years with A. Hammacher & Co., filling among other positions that of buyer. Among the goods dealt in largely by him, many of which are carried in stock, are Furniture Handles, Hat Hooks, Fancy Hinges, Picture Hooks, Upholstery Nails, packed in cartons of 50 and 100, &c. He also represents manufacturers of Cabinet Locks, Curtain Rings, Wire Nails, Screws, Chair Seats, Sandpaper, Glue, Excelsior Packing, &c.

SCHULTE, LOHOFF & Co., Evansville, Ind., advise us that they are manufacturing a full line of Solid Tool-Steel Hatchets and Hammers, forged throughout from solid Steel Bar, in addition to their old line of tools.

National Price List of Cut Nails.

AT A THOROUGHLY REPRESENTATIVE MEETING of the Nail manufacturers of the country, held at Philadelphia on January 31, the policy of having a Nail Card was abandoned, and instead of this method of quoting and selling Nails a price-list was established covering the different kinds and sizes, such list to be subject to a discount, or, more strictly, a rebate per keg. This method was considered by the manufacturers to have important practical advantages over the Nail card, and the list has been arranged so as to permit a given rebate to apply to all kinds and sizes of Nails. This price-list is herewith printed and goes into effect at once, quotations by the manufacturers to be from this list and not from card, as heretofore.

The trade will recognize this as a radical departure. It is regarded with favor by some of the manufacturers, who heretofore questioned the advisability of a revision of the Nail card, and if in practice it is found to work satisfactorily it will be

a matter of congratulation and will serve the convenience of the trade. Our readers will understand that the system now in force contemplates the quoting of Nails at a certain discount or rebate from list. For example, \$1 per keg would make a 10d Common, the list of which is \$3, to cost \$2, and a 3d fine, the list of which is \$4, to cost \$3.

National Price-List of Cut Nails, Adopted January 31, 1893, Subject to Discount \$.... Per Keg on All Sizes.

	Common, Fence, Heavy Brads, Sheathing.	Casing, Floor-ing, Slat-ing, Box and Eastern Fin-ish-ing.	Fine Blued and Fine Finish-ing.
2d.....	\$3.75	\$4.25	\$4.35
3d.....	3.55	3.65	4.00
4d & 5d...	3.35	3.50	3.60
6d & 7d...	3.20	3.35	3.45
8d & 9d...	3.10	3.20	3.30
10d.....	3.00	3.10	3.20
12d & 16d.	3.00	3.10	3.20
20d.....	3.00	3.10	3.20
30d.....	3.00	3.10	.....
40d.....	3.00	3.10	.....
50d.....	3.00	.....	.....
60d.....	3.00	.....	.....

Cut Spikes.
All Sizes.....\$3.10

Clinch.
1 1/8-inch.....\$3.90
1 3/4 ".....3.90
2 ".....3.75
2 1/4 ".....3.75
2 1/2 ".....3.60
2 3/4 ".....3.60
3 ".....3.50
3 1/2 ".....3.50
4 ".....3.50

Light Barrel and Lining.
3/4-inch.....\$4.25
7/8 ".....4.00
1 ".....3.75
1 1/16 ".....3.75
1 1/8 ".....3.50
1 1/4 ".....3.50
1 1/2 ".....3.40
1 3/4 ".....3.40

Common Barrel.
3/4-inch.....\$4.15
7/8 ".....3.90
1 ".....3.65
1 1/16 ".....3.65
1 1/8 ".....3.40
1 1/4 ".....3.40
1 1/2 ".....3.30
1 3/4 ".....3.30

Tobacco Manufacturers' Box Nails.
4d and 5d Lining.....3.35
6d and 7d.....3.20
3d Caddy.....4.00
4d ".....3.75
5d ".....3.75

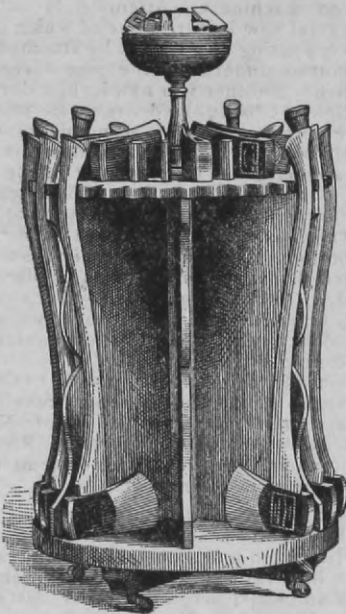
Cooper, Tobacco and Warehouse.
4d and 5d.....3.65
6d and 7d.....3.50
8d.....3.35
10d.....3.25
Each half keg 10 cents extra.

A Convenient Axe Stand.

THE ACCOMPANYING ILLUSTRATION shows a convenient form of Axe Stand designed by Samuel H. Blackwell, Fairfield, Maine. It will accommodate six dozen Axes, three dozen with handles and three dozen without. The height from the floor to top of the upper shelf is 33 inches; from floor to top of lower shelf is 6 inches, and from top of lower to top of upper, 27 inches. The shelves are 24 inches in diameter. Around the edge of the upper shelf are 36 notches in which the handles of the Axes fit, the Axes resting on the lower shelf, the weight of the bit of the Axe being sufficient to keep the handles in place. Around the upper

shelf, 6 inches from the edge, there are 18 pins shaped like the eye of the Axe, on which the unhandled Axes are placed, they being sufficiently far apart to admit an Axe between them, thus making room for 18 more Axes, and making three dozen in all. The small urn or bowl is for Axe Stones and Wedges. It stands 11 inches from the top and is 9 inches across the top. The top shelf is supported by six boards arranged at equal distance around the circle. The whole is upon casters, which allows the stand to be moved around the store at the pleasure of the dealer.

The trade will recognize the convenience of this Axe Stand, in view of its simplicity and the comparatively small space



A Convenient Axe Stand.

occupied in displaying an extensive line of goods, with the further advantage that it allows every Axe to be examined without disturbing any of the others.

Weekly Prize Competitions.
\$25.00.

FOR MORE than six months Weekly Prize Competitions (\$10) have been an interesting and useful feature of the *Pharmaceutical Record*, a journal issued from this office and devoted to the interests of the drug trade. These weekly competitions have related to a variety of technical and business questions of interest to druggists, and have brought out a large amount of information of much service to the readers of that enterprising journal. In view of the success of this feature we have decided to announce a similar series of Weekly Prize Competitions on questions of interest to our readers, and invite a general participation on the part of the trade. As the object of these competitions is to obtain information which will be of practical service to our

readers, and to discuss questions in which they are interested, we shall esteem it a special favor if any in the trade will suggest subjects for such competitions, which, if deemed suitable, we shall take pleasure in using.

In each competition there will be three prizes—a first prize of \$12.50, a second prize of \$7.50 and a third prize of \$5. The prizes will be awarded for the answers which in the judgment of the committee of award are most suitable for publication and of the most general interest. These competitions are open to every one, and it is hoped that there will be a general response from business men. Those intending to compete are reminded that it will not be necessary to write long essays, but that comparatively brief and business-like answers to the different questions will be favorably regarded as meeting the purpose for which these competitions are announced. We shall have the privilege of publishing any or all of the contributions received.

Weekly Prize Competition No. 4.

SUBJECT :
Suggestions as to Improvements in Putting up Goods.

A good deal of attention has been given by manufacturers to the matter of putting up goods, and there has been a great advance in the attractiveness and convenience of packages. There is, however, an opportunity for further improvement, and the object of this competition is to call out suggestions as to how manufacturers can still further meet the wants of the trade in this regard. This subject touches upon the following points, as well as others which will occur to our readers:

The advantage to the retailer of convenient and attractive packages.

Goods which suffer from the way in which they are put up.

Goods which are not put in boxes, but should be.

Improvements in the kind or style of boxes.

Whether packages are of convenient form or size in view of the quantity of goods contained, or shelf or other requirements.

Improvements which might be made in labels as to color, form, prominence of size or number, &c., with samples of desirable labels.

Whether it is desirable for labels to provide a place for marking the cost or selling price.

Whether directions for use are suitably given in connection with goods which require them.

Shortage in count or weight.

The following prizes will be awarded :

First prize.....\$12.50
Second prize.....7.50
Third prize.....5.00

Replies are to be received not later than February 25, 1893. They should be addressed as follows :

DAVID WILLIAMS,
96-102 Reade street,
New York.

Weekly Prize Competition No. 4.

The Weekly Prize Competitions noted below are now before our readers and remain open until the dates named:

No. 1. Closing February 4.
How to Avoid the Accumulation of Dead Stock.

No. 2. Closing February 11.
How to Keep the Store Neat and Clean.

No. 3. Closing February 18.
Waste in the Store and How to Avoid It.

No. 4. Closing February 25.
Suggestions as to Improvements in Putting up Goods.

Another subject will be announced in our next issue.

Our readers are also reminded of the following Prize Competitions, announced on another page, in each of which four prizes, of \$50, \$25, \$15 and \$10, are awarded:

No. 6. Closing February 18.
How Retailers Can Best Advertise and Extend Their Business.

No. 7. Closing February 18.
Travelers' Yarns.

No. 8. Closing February 18.
How to Treat Clerks.

No. 9. Closing February 18.
Shop System of Keeping Track of Jobs.

No. 10. Closing February 18.
Business Maxims—At Least 10.

No. 11. Closing February 18.
How Small Retailers May Keep a Record of Prices.

National Saw Company.

THERE HAVE of late been current a good many exaggerated and unfounded reports in regard to consolidation of Saw interests. The facts in the case are that the National Saw Company have bought the plants of Richardson Bros. of Newark, N. J., and the Harvey W. Peace Company of Brooklyn, N. Y. The capital of the National Saw Company has not been changed, remaining as before, \$3,000,000. The officers of the company are:

GEORGE N. CLEMONS, president.
LOUIS DUHME, vice-president.
ROBERT J. JOHNSON, treasurer.
F. B. EARLE, secretary.

The offices of the company will be at 96 and 98 Reade street, New York City.

The company advise us that they have no intention of advancing prices, the consolidation having been effected to secure economy and efficiency in the manufacturing and marketing of the goods. The point is also emphasized that Henry Diss-ton & Sons, Philadelphia, are entirely independent of the National Saw Company.

Price-Lists, Circulars, &c.

CALDWELL MFG. COMPANY, Rochester, N. Y.: Hardware specialties. Their illustrated and descriptive catalogue shows the Caldwell Sash Balance, Showcase Balance, Sash Ribbon, Acme Fastenings, Empire Sash Locks, Broom Holder, Little Gem Health Exerciser, &c.

THE WALTER A. WOOD MOWING & REAPING MACHINE COMPANY, Hoosick Falls, N. Y., with office and warehouse 161 Washington street, New York: Illustrated pamphlet. The machines, complete and in detail, are given in numerous

pictures, including some full-page illustrations of Oriental scenes, showing these implements in use by the Hindoo and other Asiatic nations. Among the goods noticed are Mowers, Reapers, Harvesters, Self-Dump and Hand-Dump Hay Rakes, Bundle Carriers, Transport Trucks, &c. All goods are sold under a warranty, the conditions of which are given at length in the front of the book.

THE CHALLENGE CORN PLANTER COMPANY, Grand Haven, Mich.: Ice Chests and Refrigerators. Their catalogue and price-list illustrates a large assortment of Ice Chests and Refrigerators designed to meet almost every want from an Ice Chest to a dining-room cabinet sideboard Refrigerator with beveled plate mirrors. There are also Refrigerators intended especially for the use of grocers, butchers, &c. The manufacturers have dispensed with pressed materials for purposes of ornamentation, and are now carving them from solid hard wood by means of improved machinery. Attention is called to several new features, one of which is a drip cup acting as a trap to be attached to the bottom underneath the pipe carrying off drip. Another is a new lock, a device for tightly closing the doors so as to exclude outside air, thus economizing the supply of ice. There may be mentioned, too, a remarkable water cooler made of iron porcelain lined, into which water may be placed and refrigerated, to be drawn off as desired through a faucet at the bottom. This tank or cooler is so arranged that it resembles when in place a panel of the Refrigerator, and can be readily taken out and cleaned with as little difficulty as would be encountered in cleaning an ordinary pan. The latter portion of the book is devoted to Corn Planters. B. B. Neal is their traveling representative for the States of New York, New Jersey, Pennsylvania, Rhode Island and Connecticut, with office at 106 Chambers street, New York.

JESSE LEE & SON, Philadelphia, Pa.: Star Brand and Diamond Brand Clippers for Horsemen and Barbers. Their catalogue illustrates 25 Clippers of different styles and sizes, accompanied by descriptions and prices. They are shown with and without anti-friction steel ball bearings, both in the horsemen and barber Clippers. It is remarked that every Clipper, from the highest-priced to the lowest, is packed in a box neatly labeled, and that the Clippers are carefully examined and tested, so it is known that all are in perfect cutting order when they leave the factory.

H. O. CANFIELD, Bridgeport, Conn.: Vulcanized Rubber for mechanical and manufacturing purposes. An illustrated price-list shows Bibb Disks, Molded Pipe Unions, Molded Glass Gauge Gaskets, Floor Plate Flange Rings, Bumpers, Molded Rings, &c.

Calendars.

WITH THE COMPLIMENTS of John A. Roebling's Sons Company, manufacturers of Wire Rope, &c., 117-119 Liberty street, New York, is sent a handsomely engraved card with calendar sheets for 1893. Around the edge of the card is a reproduction of a Wire Rope, within which are four designs, representing the products of the company; Iron, Steel and Copper Wire, Telegraph, Telephone and Electric Light Wires. The calendar is artistic in design and execution, and admirably illustrates the line of goods made by this firm.

HALL & CARPENTER, 709 Market street, Philadelphia, Pa., send a series of steel engravings on cards, which are held together by a ribbon and form a handsome calendar for 1893. The dates of two months are given on each of the six cards forming the set, the engraving on each card representing scenes appropriate to the season of the year covered by the month. Thus for January and February a winter mountain scene is shown; for March and April a fishing smack, &c. On the back of each

card are dates for the entire year. Each card calls attention to a different line of goods which the firm import or for which they are agents. The calendar is artistic in execution and arrangement, and is entitled to a prominent place in the office.

POPE MFG. COMPANY, Boston, send an 1893 calendar consisting of a circular piece of cardboard, 15 inches in diameter, near the top of which are attached date sheets beginning with February, '93 and ending with February, '94. The circumference of the calendar picture is framed with a reproduction of the pneumatic Rubber Tire. The picture is in water-colors, and represents a country scene, with a bicycling couple in the foreground resting on a seat after a ride.

THE WM. ROGERS MFG. COMPANY, Hartford, Conn., send us a neat calendar, on which is a fishing scene, appropriately festooned with rope, anchor and net. Attention is called to their Electro Gold and Silver Plate Flat and Hollow Ware. Date leaves are attached near the bottom of the card.

Across the Continent.

THE FOLLOWING LETTER from Polhemus Lyon, on his trip homeward from San Francisco to New York, will be read with special interest. After his extended tour around the world Mr. Lyon reached home safely and is the recipient of a hearty welcome from his many friends and of congratulations on the success of his trip.

JANUARY 4, 1893.

As our steamer from Australia approached the wharf at San Francisco on December 22 we noticed many flags at half mast, which, upon inquiry, we learned had been lowered out of respect to the memory of L. L. Baker of Messrs. Baker & Hamilton, the wholesale Hardware merchants. Mr. Baker had died suddenly the day before after 40 years of business life in California, and leaves not only an estate of over half a million, but a name highly honored and respected, the daily press speaking of him as "probably the foremost merchant of San Francisco." On the morning of his funeral many of the wholesale merchants and all the Hardware trade closed their doors.

In this connection the many friends of the firm will regret to learn that Mr. Hamilton, only surviving partner, suffered a severe stroke of paralysis on Thanksgiving Day, incapacitating him for business. On December 31 Messrs. Carolan & Co., after a long period of Hardware merchandising, retired from business, having closed out their stock gradually during the year.

There are three other old wholesale houses, one of whom it is rumored would gladly yield the field if opportunity occurs, and a new firm has sprung up some two years ago. There are five wholesale Hardware houses, however, which with the curtailing of their territory through the increased competition of Oregon and Washington jobbers, makes the market sufficiently close to attract trade.

The rehabilitation, so to speak, of sail freight has changed business on the coast very much. I am told by the buyers that

two-thirds of their Eastern purchases now come around the Horn as 20 years ago. It takes four months, and costs less than 40 cents per 100 pounds, and about the same as from New York to Australia. Of course this freight rate holds the territory for San Francisco against ambitious St. Louis and Chicago houses who a few years ago were doing quite a business in this field.

On reaching Salt Lake City we begin to learn what ravages the fall in silver has accomplished. The Hardware merchants in this city depend largely upon the mines for prosperous business, since they deal extensively in miners' supplies, and indeed, though agricultural fields are tributary, all business seems to act in sympathy with the greater industry.

I was rather surprised to learn how much the people in this section looked to the Brussels Conference for help, and only since this hope proved delusive have the mines begun to suspend work. During the month several have shut down entirely, and others very greatly reduced their force, since comparatively few can show a profit with silver at about 80 cents. A falling off of nearly 50 per cent. in sales, as one hardware house reports, is indeed a serious matter.

At Denver less is heard of the silver question, because their interests are more varied. What a wonderful city this is—celebrating its thirty-fourth birthday a few weeks since and reporting a population of 140,000 net, with several of the finest buildings on the continent!

The leading retail house here, after having for five years systematically built up a scrapbook from the admirable articles in *The Iron Age* relating to store interiors, have fitted up what struck me as being the most attractive, convenient and serviceable Hardware store I have ever visited. The two or three more prominent features were the Builders' Hardware Pavilion, inclosing a space perhaps 10 feet square; the doors and windows, &c., were trimmed with the specialties they desired to push, so that these might be examined in actual use, while the counters and endless drawers within exhibited a very complete line up to the most exquisite art goods lately brought on the market so as to satisfy the millionaire as well as the millions.

A pneumatic cash service does away with the overhead cash railway, and ingeniously arranged shelving, receding a few inches in every 12 or 15 of rise, made the shelf 15 feet from the floor instantly accessible without railway or trolley ladder.

Many other serviceable devices were noticed which would attract a practical man; but my yarn, as they say in Australia, is spun long enough.

POLHEMUS LYON.

Bird Cages, Etc

THE ANDREW B. HENDRYX CO., New Haven, Conn., Bird and Animal Cages, Jack and Safety Chains, Wire Picture Cord, Fishing Reels, Cage Specialties and Aluminum Spun, Stamped and Flat Special Blanks. The company issue a handsome 1893 catalogue, devoted

to Cages, Cage Specialties, Chain and Wire Picture Cord. An index gives the goods shown, followed by the enumeration of a large variety of Cased Cages. Especial prominence is given to Brass and Gold Bronze Cages, in which the makers state the best spring Brass Wire is used and that every wire is firmly riveted to the rails by machinery, no solder being used. In addition to this catalogue the company issue a catalogue devoted entirely to the Hendryx Fishing Reels, of which they make a large line. The features of these reels manufactured with their patented improvements are lightness, durability and wearing qualities.

Bicycles.

SEVENTH ARTICLE.

ARIEL CYCLE MFG. COMPANY, Goshen, Ind., will put on the market for 1893 a Geared Ordinary. Sample machines have been ridden hundreds of miles by different expert riders, and by them pronounced entirely satisfactory. Many improvements have been made in their line of wheels, as the result of criticisms and suggestions made by their customers. In addition to the Geared Ordinary they make a Model C Bicycle, a Model D, and a ladies wheel, the Titania Model B. In the Geared Ordinary the lines are symmetrical, with handle bar and handle in a position to insure the most desirable results. The front wheel is 36, 40, or 44 inches and geared to 60, 66 or 72 inches. The rear wheel is 24 inches; both wheels have 2-inch pneumatic tires. The machine has ball bearings throughout and weighs 38 pounds. The Model C is patterned somewhat on the lines of their last year's model, retaining all the good points and features, and adding some improvements for this season. The weight of the wheel is 35 pounds. Model D has a diamond shaped frame, with a 10½-inch head; simple crank fastener; dust-proof bearings; 28-inch wheels; Warwick hollow rims; all connections drop forged; and geared to 64 inches unless otherwise ordered. This machine weighs from 30 to 32 pounds. The Titania is a double drop frame ladies' wheel with hollow rims, front brake, extra brace in frame, resulting in a wheel weighing 36 pounds. Particular mention is made of the easy running and steering qualities of this machine.

HICKORY WHEEL COMPANY, Newton, Mass., are putting on the market for 1893 the Hickory A, Hickory B, stripped; and Hickory C, a ladies' wheel. The Hickory A, their leading machine, is made with steel diamond frame and hickory wheels similar to their Model A of last year but considerably improved. The machine is regularly equipped with a rigid tubular handle bar, handsomely curved and dropped, and tubular forks. When so ordered the machines will be furnished with spring handle bar and spring forks, which were successfully used last year. They will continue to use Columbia pneumatic tires, and will fit with elliptical sprocket wheel when so ordered. The weight, all on, including tool bag and tools, is 43 pounds. The Hickory B is the

same as the A with all detachable parts removed and weighs 37 pounds. They present for a ladies' machine their Model C improved. These machines have been fitted with ball bearings all around with the exception of the head; and the construction of the machine has been so altered that ample room is allowed between guards and tires to prevent any clogging up. The machines are fitted with 1½ cushion tires, and may be finished in a variety of colors. The company this year are under new management, with enlarged plant and greatly increased capital.

OVERMAN WHEEL COMPANY, Chicopee Falls, Mass., include in their line of Victor Bicycles for 1893, Model D, Model E, Victor Flyer, Model B, Model C and the Victoria. Model D is adapted to either light or heavy riders, although weighing less than their last year's model of this design. Weight has been lessened wherever possible, but care has been taken that strength and wearing qualities should not be sacrificed. Attention is called to their rubber mud guards, lighter cranks of novel pattern and lighter tubing. Both front and rear sprockets are removable and interchangeable with new parts, and the driving sprocket may be removed without disturbing the crank or separating the chain. The tubing, known as Mannesmann, is drawn spiral by twisting strain. The company state that they are the only American makers using this tubing. The weight, with rat trap pedals and No. 15 saddle, is 35 pounds. Model E is the same as the D machine with the exception of the Victor spring fork, which is substituted for the rigid fork. The Flyer is designed for a light, speedy road wheel, and is also well adapted to the track. It is built similar to Model D, except that the Flyer is constructed of slightly lighter tubing and is stripped of brake, mud guards and similar attachments. The machine is geared to 63 inches and weighs 28 pounds. Either Model D or the Flyer are fitted with elliptical gearing, at the option of the purchaser. The Victoria has been on the market since 1890, but the weight has been reduced. Either pneumatic or arch tires are used with rigid or spring fork, the machine weighing 38 pounds.

MARBLE CYCLE MFG. COMPANY, Plymouth, Ind., and 271 Wabash avenue, Chicago, have for the coming season the Smalley Light Roadster, Smalley Road Racer, Smalley Track Racer, the Buck, and Smalley Ladies' Wheel. These Bicycles are built with the idea of supplying an existing demand for wheels combining strength and rigidity, with lightness and simplicity of construction. In the building of the Ladies' Wheel and Track Racer the requirements of their respective riders have been carefully considered. The Light Roadster has a diamond frame, 9 inch steering head, 61 or 66 inch gear, Morgan & Wright pneumatic road tires, plunger convex brake, pneumatic tire pump, tools, and weighs, stripped, 36 pounds. The Road Racer has a 45 inch wheel base, and weighs 30 pounds. The Buck has diamond frame, built to reach without seat

post, handle bars springing from fork crown, geared to 61, 66 or 73 inches, spiral effect in spokes; weight, 22 to 24 pounds. The manufacturers were unable to give specifications of the Ladies' Wheel in the advance edition of their catalogue.

THE AMERICAN ORMONDE CYCLE COMPANY, 2081-2083 Seventh avenue, New York, are introducing an Ormonde Front-Driving Safety, with 36-inch front wheel and 26-inch rear wheel, geared to 64 inches. It is fitted with the New York Belting & Packing Company's self healing tires. Two wheels are built on the lines of their Model D Ormonde, one a 26-pound road racer, the other a 38-pound roadster. Both of these machines have embodied in them the latest improvements. Two high grade ladies' wheels, weighing 36 and 38 pounds each, are built on excellent lines, and fitted with suitable dress guards. The Model C Ormonde is made in practically the same form this year as last. The company make a feature of Bicycle sundries.

GORMULLY & JEFFERY MFG. COMPANY, Chicago, continue to make their spring-frame Ramblers, though somewhat lighter. In addition to that line they market a line of rigid-frame Ramblers, Nos. 1, 2, 3 and 4, Ladies' Rambler Model B, and the Rambler Racer, weighing 23 pounds. They also continue the manufacture of the G. & J. Pneumatic Tire and G. & J. Racing Tire. The No. 1 Rambler is adapted for localities where rough, hilly or stony roads abound. It weighs 50 pounds, all on; stripped, 45 pounds. The No. 2 is a lighter wheel, weighing 39 pounds. No. 3 is a rigid-frame wheel, designed for experienced riders on good roads where speed and lightness of machine are sought. The machine weighs, with road saddle, pedals and tool bag filled with tools, 37½ pounds, actual scale weight. The No. 4 is of the same type as No. 3, except having a shorter wheel base and a shorter distance from the seat post to the pedals. When fitted with road saddle, pedals, brake mechanism, tools and tool bag it weighs about 33 pounds. No radical change has been made in the Ladies' Rambler, Model A, for this year. The Ladies' Model B is a new rigid frame ladies' machine, somewhat lighter than the A, with a lower and longer frame, giving more room between handle bars and saddle, and is fitted with equal sized wheels. The Combination Rambler has been improved in detail, and is recommended to those desiring a strong, light running and easy riding safety, suitable for both sexes. Boys' Ideal and Girls' Ideal Ramblers are also made.

SCHOVERLING, DALY & GALES, 302 Broadway, New York, control the Humber wheels for the Eastern and coast States. These wheels are noted for strength, simplicity and excellence of workmanship. The line includes a No. 1 Roadster; No. 3, Special Track and Road Racer; No. 5, Road and Track Racer; No. 14, Roadster; No. 17, Roadster; Ladies' No. 7 and Ladies' No. 8, fitted with dress guards and balls all around. The Humber wheel

shows no great change in design over the '92 model, but the ladies' as well as the gentlemen's pattern are built on straight lines.

SIMMONS HARDWARE COMPANY, St. Louis, Mo., are handling two lines of medium grade wheels complete, one medium grade and one highest grade, all made in this country. The names adopted by them are Lyndhurst, Westminster and S. H. Co.'s Western Bicycles. Their machines are all of the lightest patterns, and their sales on them so far this season have been exceptionally large.

It Is Reported—

That the Hardware store of J. F. Barber & Co., Phillipsburg, Pa., was destroyed by fire on the 16th ult. The loss was \$9000; fully insured.

That the Parkinson Lumber & Hardware Company have been formed at Palo Alto, Cal. The capital stock is \$100,000. The directors are John F. Parkinson, N. B. Scofield, G. R. Parkinson, L. C. Ferguson and Joseph Hutchinson.

That the Allerton-Clarke Company, have been formed in Chicago. The capital stock is \$50,000. The company will deal in Hardware. The incorporators are Cortlandt C. Clarke, Crandall A. Rosecrans and Samuel W. Allerton.

That W. H. Wibbs' Hardware store, at Prospect, Ohio, was damaged by fire on the 16th ult. Loss, \$1000.

That Frank Dorrance, son of W. H. Dorrance, Hardware merchant, Gamden, N. Y., has been taken into partnership. The firm name will hereafter be W. H. Dorrance & Son.

That Elliot & Kennedy have opened a Hardware store at Hamilton, Ohio.

That the Peters Hardware Company have been formed at Emporia, Kan. The directors are George B. Peters, Edwin R. Peters, Hattie G. Peters and George W. Gooding, all of Emporia. The capital stock is \$40,000.

That Konow & Donovan are a new Hardware firm at Ivesdale, Ill.

That Henry G. Burrell, dealer in Hardware and Tin, Stoughton, Mass., is erecting an addition to his store.

That Augustus Young is about to sell out his Hardware business at North Berwick, Maine.

That a new Hardware store has been opened at Sarahsville, Ohio, by Chas. F. Hellyer.

That James Ferman, dealer in Hardware, Creston, Iowa, has taken Frank Kingsbury of Adair into partnership with him.

That the Lofton Hardware Company of Chattanooga, Tenn., who were recently incorporated, have commenced business at 824 Market street. For the present the company will confine themselves to the retail trade, and will handle everything in Heavy, Shelf and Builders' Hardware. Their specialty will, however, be Sporting Goods, and Rifles, Guns, Baseball Goods, Fishing Tackle, &c., will be carried by them. The officers of the company are: Jno. M. Lofton, president and treasurer; W. H. Boyle, vice-president, and H. B. Rigg, secretary.

That David Nesbit has embarked in the Hardware business at Brockport, N. Y.

That Indianola, Iowa, has a new Hardware store, the proprietor of which is F. L. Beymer.

That the Hardware firm of Bressler & Schmebl, Lebanon, Pa., have been dissolved by mutual consent, and the interest of Mr. Bressler has been purchased by

C. Dorsey Gloninger. The business will hereafter be conducted under the style of Schmebl & Gloninger.

That the Hardware firm of Humphrey & Brown of Delevan, N. Y., has been dissolved, Mr. Humphrey retiring.

That H. A. Cook of Hoopeston, Ill., will move his stock to Ladoga, Ind.

That James T. Reber and his son, James C. Reber, will retire from the Hardware firm of Bard, Reber & Co., Reading, Pa., having sold their interest to George W. and James M. Bard.

That Joseph P. Smith's Hardware store at Lock Haven, Pa., was destroyed by fire on the 6th ult.

That a change has occurred in the Hardware firm of Palmer & Tharratt, Boonville, N. Y., the senior member, Mr. Palmer, selling out his interest to Brinckerhoff C. Tharratt. The copartnership had existed for 11 years and had been one of the most prosperous firms in Boonville. The business will hereafter be conducted by Mr. Tharratt.

That the Hardware store of D. S. Conley, Chateaugay, N. Y., was destroyed by fire on the 11th ult.

That John Watson, Hardware merchant, Houlton, Maine, has purchased W. G. Brown's Hardware store at the same point.

That Averitt & Sabin, Farmer City, Ill., moved their stock of Hardware, Implements, &c., into their new building on February 1.

That John Rothenmeyer has sold his Hardware business at Clarence, N. Y., to Charles Parker.

That Sibley & Place's Hardware store at Essex Junction, Vt., was burned to the ground on the 5th ult. The insurance is \$5000.

That C. M. Smith is closing out his Hardware business at Cloverdale, Cal.

That the Hardware and Implement firm of Carpenter & Stanfield, Seymour, Ind., have dissolved. T. J. Stanfield will continue the business.

That J. H. Nisban & Co., Hardware merchants, Salt Lake City, Utah, have disposed of their stock to the Salt Lake Hardware Company.

That there is an opening for a Hardware store at Athelstan, Mo.

That Charles Stuart of the Hardware firm of Stuart & Morehouse, Chesaning, Mich., has sold out to his partner, and has bought the stock of Whipple Bros. & Granger, and will run the business alone at the latter's old stand.

That Mitchell Bros., Bentleyville, Pa., will remove their stock to Beallsville, Pa.

That Dowell & Field, McKinney, Texas, have purchased the Agricultural Implement stock of J. P. Dowell, who will hereafter confine his attention solely to the Hardware business.

That J. E. Porter, dealer in Hardware, Ottawa, Ill., was the recipient at the first of the year of an elegant office chair, the gift of his employees.

That the Hardware stores of Auburn, N. Y., will close every night, Mondays and Saturdays excepted, until April 1.

That Burr Bros.' Hardware store at Odessa, Mo., was destroyed by fire on the 6th ult.

That Geo. D. Cunningham has purchased the interest of A. A. Wood in the Hardware business of Wood & Cunningham, Riverside, Cal.

That a limited stock company was organized at Plaquemine, La., on the 5th ult., to carry on an extensive wholesale and retail Hardware business.

That the Morehouse & Wells Hardware Company have been incorporated at Decatur, Ill., with a capital of \$120,000.

The incorporators are George E. Morehouse, W. T. Wells and Charles M. Hurst.

That the Montpelier Hardware Company have been organized at Burlington, Vt., with officers as follows: D. L. Fuller, president; H. L. Dean, vice-president, and C. H. Fuller, general manager. The new concern has acquired the Hardware business of D. L. Fuller & Son.

That the Hardware store of W. A. Bream of York Springs, Pa., has passed into the hands of G. W. Hartzell.

That Solomon Weaver and Lemuel Kauffman have formed a partnership to go into the Hardware business at East Berlin, Pa. They will be ready to meet the wants of customers on April 1.

That the Cumberland Hardware Company, Cumberland, Wis., have been incorporated, with a capital stock of \$10,000. The incorporators are S. H. Waterman, F. L. Olcott, S. M. Dixon, J. M. Dixon, J. M. Pereles and S. C. Herbst.

That the Hardware store of Ira Van Valkenburg, Hastings, Mich., was badly damaged by fire on the 12th ult.

That W. H. Matchett, Corsicana, Texas, has sold his Hardware business to A. C. Johnson and F. P. Wood, who will conduct it under the style of Johnson & Wood.

That there is an opening for a Hardware and Tin store at Modena, N. Y.

That Rood Bros.' Hardware establishment in Kansas City, Mo., was destroyed by fire on the 13th ult.

That H. Harrold has purchased the Hardware stock of Henry Hough, Yardley, Pa., and will continue the business.

That Bradford Kennedy & Sons, wholesale Hardware, Syracuse, N. Y., will erect an addition to their establishment on West Washington street, between Franklin and Clinton streets. The new structure will be 26 x 36 feet, brick, four stories high, and its cost is estimated at \$32,000.

That John J. Hanson, a long-established Hardware merchant of Gloversville, N. Y., will sell out and retire from business on account of ill-health.

That D. S. Coonley, dealer in Hardware, Chateaugay, N. Y., was burned out on the 11th ult.

That Holmes Bros., dealers in Hardware, St. Hilaire, Minn., have dissolved.

That John Karst, Hardware dealer, Stillwater, Minn., has been succeeded by the Eagle Hardware Company.

That Tibbott Bros., Hardware dealers, Rialto, Cal., have sold out to J. H. Kingman & Co.

That Anderson & Ireland, Hardware merchants, Baltimore, Md., have dissolved. N. L. Ireland will continue the business under the old style.

That S. L. Fisher, Hardware merchant, Negley, Ohio, has sold out to Richardson & Son.

That V. S. Pownall has entered the Hardware and Implement business at Christiana, Pa.

That D. C. Schnader & Son, dealers in Hardware and Stoves, Reading, Pa., have dissolved. Schnader, Nagle & Co. will continue the business.

That Goggans & Fant, Newberry, S. C., are now carrying on the Hardware, Stove and General Merchandise business formerly conducted by Boozer & Goggans and O. H. P. Fant & Son.

That J. W. Hines has retired from the Agricultural Implement firm of Hines & Gaskill, Elma, Wash.

That Dolbow & Thayer, Hardware dealers, Annandale, Minn., have been succeeded by Yaiser & Patterson.

That Albrecht Brothers are now conducting the Hardware business formerly carried on by Charles Damerel, Wahpeton, N. D.

That Solon D. Pumpelly has bought a half interest in the Hardware, Implement and Grocery business of Frank Farnsworth at McLean, Ill.

That the Durand Hardware Company have been organized at Durand, Ill., with a capital stock of \$10,000. The incorporators are: C. A. Norton, Frank Sheik and M. Geary.

That J. T. Travers, Hardware dealer, Ellensburg, Wash., has sold out.

That Riggs & Sons are a new Hardware firm at Cabery, Ill.

That the Hardware store of M. Schaeffer & Co., Westminster, Md., was burglarized on the 8th inst. and \$150 worth of goods stolen.

That J. H. Johnston & Co., dealers in Fire Arms and Cutlery, Pittsburgh, Pa., were robbed on the 13th inst. About \$400 worth of fine Revolvers and Razors was secured by the thieves.

That the Hardware store of Henry Manz, Oakfield, Wis., was robbed on the 6th ult.

That Frank Kellogg of Blandinsville, Ill., expects to go into the Hardware business at La Harpe.

That John Balkema has purchased the Hardware store of A. Gaddis, Oakland Hill, Ind.

That J. B. Lohman of the Hardware firm of Lohman & Ripper, Pekin, Ill., has sold out his interest in the business to Henry Becker, a farmer in the vicinity.

That the Lowry Hardware Company of Atlanta, Ga., have added a Bicycle department to their business. The department will be under the charge of Edward Chalfant, a well-known wheelman of Atlanta.

That the Hardware store of James Hamil, West Troy, N. Y., was damaged by fire on the 30th ult.

That in a large fire at Memphis, Tenn., on the 3d ult., the building of the Matthews Hardware Company was destroyed. The loss is \$70,000, with an insurance of about \$50,000.

That J. N. Anthoine & Sons' Hardware store at Biddeford, Me., was burglarized on the 3d ult.

That R. B. Norton & Co.'s Hardware establishment at Halifax, N. S., was destroyed by fire on the 30th ult.

That J. Russell & Co., Hardware merchants, Holyoke, Mass., have disposed of their branch store at Northampton, which they have been running for the past two years, to C. W. Rackcliffe.

That the Hardware business of Thomas Henderson at Far Rockaway, L. I., has been sold to D. L. Starks. Mr. Henderson commenced business in Far Rockaway about ten years ago in a small store with only a few hundred dollars' worth of stock. He has been very successful, and at the time of selling had one of the largest business establishments in the town, with a stock valued at \$25,000. He retires from the business in order to give attention to other matters in which he is interested.

That Barker, Belden & Co., Pittsfield, Mass., will add a repairing department to their Hardware store. They will probably erect a small building in the rear of their store.

That Thomas N. Murphy's Hardware store at Sprague, Wash., was slightly damaged by fire on the 31st ult.

That the Mound City Hardware Company of St. Louis has been incorporated with a capital of \$15,000. The incorporators are T. F. and John A. Dunlap and Herman Quernheim.

That J. C. Murdock & Co., Hardware merchants, of Lehigh, Mo., have removed to Zincite.

That the Hardware store of Henry Manz, Oakfield, Wis., was recently visited by burglars and \$75 worth of goods stolen.

That fire destroyed the Hardware store of John L. Drainie, Elora, Ont., on the 3d inst.

That the N. T. Bushnell Company have been organized at New Haven to deal in General Hardware, &c., with a capital stock of \$30,000, in 300 shares of \$100 each; \$6000 of this amount has been paid in cash. The stockholders are N. T. Bushnell, W. H. Burchell and Arthur Griggs.

That Klement & Davis, Hardware merchants at Mount Vernon, Wash., have dissolved partnership.

That R. T. Barnett & Co., dealers in Hardware, Bozeman City, Mont., have dissolved. The business will be continued at the old stand by R. T. Barnett

That Tuttle & Neff, Hardware dealers, Mankato, Minn., have sold out to J. E. Neff.

Exports.

THE EXPORTS from the port of New York to foreign markets for the week ending January 21, 1893, exclusive of specie, amounted to \$6,209,932. The following are the exports of Hardware, Machinery, Metals and related goods. The totals following each port or country indicate the aggregate value of exports to such port or country exclusive of specie. The items for Canada and Mexico include merchandise by seagoing vessels only:

ANTWERP.—Total, \$219,221.

Agricult. Impts.	\$170	Iron Drums.....	\$370
Sandpaper.....	5	Pumps.....	225
Nails.....	8	Electrical Matl....	305
Hardware.....	494	Typewriters.....	200

AMSTERDAM.—Total, \$109,384.

Carpet Sweepers.	\$50	Iron Safe.....	\$20
Hardware.....	488	Brushes.....	5
S. ears.....	240	Plated Ware.....	67
Manufd Wood....	15	Scythe Stones....	70
Agricult. Impts.	239	Machinery.....	1,525

ATHLONE.

Agricultural Implements.....	\$575
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ARGENTINE REPUBLIC—Total, \$174,718.

Cutlery.....	\$92	Machinery.....	\$4,882
Agricult. Impts.	67,135	Cartridges.....	745
Windmills.....	1,186	Brushes.....	3,148
Pumps.....	1,53	Manufd Wood....	1,092
Lamp Goods.....	1,905	Firearms.....	1,983
Models.....	25	Scales.....	141
Cotton Cord.....	126	Twine.....	1,52
Sandpaper.....	370	Packing.....	65
Cuspidors.....	75	Refrigerators....	25
Hardware.....	2,752		

AUSTRALIA.—Total, \$37,863.

Cutlery.....	\$1,000	Manufd Wood....	\$1,693
Brush Makers'	200	Woodware.....	444
Material.....	1,089	Lamp Goods.....	648
Carriage Material.	1,089	Sandpaper.....	30
Thermometers....	61	Agricult. Impts.	542
Cartridges.....	185	Manufd Iron....	1,266
Nails.....	145	Nails.....	150
Wagons.....	12	Cartridge Shells..	70
Firearms.....	221	Gun Primers.....	12
Car Wheels.....	566	Pumps.....	20
Sewing Machines.	420	Musical Insts....	500
Rubber Goods....	193	Saws.....	85
Machinery.....	130	Pins.....	110
Slates.....	530	Typewriters.....	15
Primed Shells....	60	Clocks.....	4
Hardware.....	4,752		

BEYROUT.—Total, \$267.

Lamp Goods.....	\$102
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BELFAST.—Total, \$6,365.

Agricult. Impts.	\$600	Lamp Goods.....	\$78
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BARCELONA.—Total, \$5,891.

Hardware.....	\$131
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BRITISH EAST INDIES.—Total, \$14,616.

Pumps.....	\$491	Clocks.....	\$2,801
Lamp Goods.....	100	Manufd Iron....	315
Boiler Compound.	445	Freezers.....	90

BOLIVIA.—Total, \$225

Cart.....	\$125	Organ.....	\$100
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BUCHAREST.		CUBA.—Total, \$287,587.		LONDON.—Total, \$576,481.	
Rope.....	\$375	Hardware.....	\$5,984	India Rubber.....	\$8,700
BALE.		Manufd Iron.....	9,763	Freezers.....	30
Typewriters.....	\$395	Lamp Goods.....	1,097	Wringers.....	32
BERLIN.—Total, \$7,081.		Scales.....	1,782	Belting.....	89
Typewriters.....	\$5,803	Cart Material.....	1,454	Aluminum.....	1,200
Machinery.....	375	Agricuilt. Impts.....	1,231	Mica.....	210
BRITISH POSSESSIONS IN AFRICA.—Total, \$33,257.		Crate Material.....	150	Fire Hose.....	255
Manufd Wood.....	\$2,510	Car Seats.....	480	Agricuilt. Impts.....	2,324
Woodware.....	454	Iron.....	689	Clocks.....	1,978
Nails.....	220	Brushes.....	52	Corset Wire.....	218
Agricuilt. Impts.....	428	Printing Press.....	330	Tinware.....	100
Cart.....	40	Clocks.....	559	Manufd Iron.....	1,002
Brushes.....	175	Carriages.....	500	Sewing Machines.....	400
Scales.....	35	Cutlery.....	1,844	Rubber Scrap.....	369
Agricuilt. Impts.....	390	Tin.....	151	LIVERPOOL.—Total, \$1,074,219.	
BREMEN.—Total, \$370,744.		Barrows.....	57	Copper.....	\$14,000
Glue.....	\$400	Cane Cars.....	3,410	Sewing Machines.....	5,500
Machinery.....	2,870	Asbestos Covering.....	891	Hardware.....	2,200
Sleighs.....	75	Rubber Goods.....	112	Machinery.....	8,560
Wagon Matl.....	1,294	Manufd Copper.....	451	Electrical Matl.....	2,400
Manufd Wood.....	30	Locomotive Matl.....	1,290	Car Wheels.....	6,200
Opt. Goods.....	70	Hose.....	357	Wheelbarrows.....	150
BRISTOL.—Total, \$336,183.		Manufd Steel.....	817	Cart.....	150
Zinc Ashes.....	\$250	Railroad Material.....	145	Agricuilt. Impts.....	353
Clocks.....	86	Needles.....	188	Watches.....	1,000
BRITISH GUIANA.—Total, \$15,966.		Saws.....	286	Manufd Steel.....	50
Woodware.....	\$45	Nails.....	286	Windmills.....	46
BRAZIL.—Total, \$131,634.		Sandpaper.....	49	India Rubber.....	3,441
Hardware.....	\$537	Coffin Material.....	265	Brass Goods.....	14
Manufd Iron.....	205	Slates.....	34	Emery.....	22
Firearms.....	3,315	Plated Ware.....	34	Carriage.....	1,000
Cartridges.....	813	DUTCH EAST INDIES.—Total, \$9,772.		Bicycles.....	500
Sewing Machines.....	150	Plated Ware.....	\$950	MEXICO.—Total, \$139,770.	
Tacks.....	127	Lamp Goods.....	\$100	Manufd Iron.....	\$1,884
Plated Ware.....	2,969	DUNDEE.		Lamp Goods.....	856
Pumps.....	64	DARMSTADT.		Nails.....	202
Manufd Wood.....	184	DANISH WEST INDIES.—Total, \$338.		Belting.....	46
Lamp Goods.....	413	DUTCH WEST INDIES.—Total, \$20,499.		Pumps.....	105
Rubber Goods.....	192	Hardware.....	\$66	Brass Tubes.....	20
Twine.....	28	Manufd Wood.....	9	Cartridges.....	2,316
Whee barrows.....	140	Machinery.....	585	Barrows.....	21
BRITISH HONDURAS.—Total, \$3,879.		Saws.....	4	Bells.....	115
Sewing Machines.....	\$352	Clocks.....	32	Brushes.....	10
Nails.....	18	Sugar Molds.....	12	Firebricks.....	585
Tinware.....	10	Brushes.....	10	Rubber Goods.....	317
Brushes.....	27	Baby Carriages.....	8	Iron Pipe.....	292
Lamp Goods.....	3	Tinware.....	5	Sewing Machines.....	2,786
Packing.....	19	Scales.....	4	Fuse.....	618
BRITISH WEST INDIES.—Total, \$116,840.		ECUADOR.—Total, \$12,546.		Manufd Copper.....	401
Manufd Iron.....	\$258	Hardware.....	\$17	Asb. Covering.....	115
Machinery.....	65	Rubber Goods.....	8	Roofing Material.....	85
Electrical Goods.....	256	Manufd Iron.....	250	Railroad Material.....	1,100
Woodware.....	133	Cutlery.....	50	Sugar Mills.....	469
Steering Wheel.....	46	FRENCH POSSESSIONS IN AFRICA.—Total, \$369.		Scales.....	508
Building Matl.....	20	Hardware.....	\$49	Grindstones.....	32
Gymn. Goods.....	20	Agricuilt. Impts.....	\$77	Crucibles.....	41
Carriages.....	858	GLASGOW.—Total, \$342,118.		Bicycles.....	200
Refrigerators.....	52	Lamp Goods.....	\$460	Woodware.....	9
Whips.....	13	Sewing Machines.....	3,400	Clocks.....	190
Surgical Insts.....	10	Woodware.....	210	Packing.....	121
Nails.....	10	Bird Cages.....	9	Tricycles.....	87
Lead.....	17	Manufd Wood.....	3,928	Tacks.....	\$30
Fish Lines.....	28	GHENT.—Total, \$604.		MARSEILLES.—Total, \$133,970.	
Manufd Steel.....	50	Waste.....	\$40	Agricuilt. Impts.....	\$8,343
Nails.....	15	GIBRALTAR.—Total, \$1,319.		Wagons.....	250
Ox Yokes.....	31	Firearms.....	\$1,208	MALTA.—Total, \$164.	
Organ.....	69	Gun Covers.....	\$101	Lamp goods.....	\$90
Velocipedes.....	7	GIJON.—Total, \$308.		MOSCOW.	
Rubber Goods.....	38	Hardware.....	\$27	Agricuilt. Impts.....	\$2,250
Firearms.....	29	Clocks.....	\$6	NUREMBERG.	
Saws.....	3	HAMBURG.—Total, \$426,230.		Rubber Goods.....	\$496
Hand Trucks.....	13	Agricuilt. Impts.....	\$3,281	NAPLES.—Total, \$737.	
Telephones.....	120	Waste.....	\$9,030	Agricuilt. Impts.....	\$45
Packing.....	7	Organs.....	1,050	NOVOROSSISK.	
Hardware.....	788	Hardware.....	3,086	Agricuilt. Impts.....	\$5,100
Manufd Wood.....	114	Sewing Machines.....	6,033	NEWCASTLE.	
CANADA.—Total, \$31,847.		Brit. Ware.....	215	Manufd Wood.....	\$30
Metal Goods.....	\$39	Electric Material.....	350	ODESSA.—Total, \$725.	
Oxide Cobalt.....	561	Copper.....	127	Agricuilt. Impts.....	\$415
CORK.		Typewriters.....	300	Freezers.....	245
Machinery.....	\$1,000	Wire Goods.....	22	PHILIPPINES.—Total, \$27,986.	
CHILL.—Total, \$1,239.		Granite Ware.....	24	Plated Ware.....	\$4,300
Hardware.....	\$130	Scales.....	8	PERU.—Total, \$8,895.	
Woodware.....	37	Barometer.....	40	Watches.....	\$1,046
Jewel Boxes.....	15	HAYTI.—Total, \$54,980.		Hardware.....	148
Lead Seals.....	1,250	Manufd Iron.....	\$62	Machinery.....	4,178
CONSTANTINOPLE.—Total, \$3,618.		Sugar Trucks.....	7	Cartridges.....	63
Machinery.....	\$596	Nails.....	16	Scales.....	55
CREFELD.		Carriage Material.....	10	PORTO RICO.—Total, \$9,676.	
Machinery.....	\$590	Machinery.....	93	Manufd Iron.....	\$293
CENTRAL AMERICA.—Total, \$47,208.		Sewing Machines.....	72	Twine.....	32
Manufd Wood.....	\$21	HAVRE.—Total, \$287,105.		Velocipedes.....	30
Watch.....	11	Agricuilt. Impts.....	\$499	Carriage Matl.....	36
Cutlery.....	208	Manufd Iron.....	\$100	Nails.....	51
Nails.....	63	Electric Material.....	175	Blower.....	200
Sewing Machines.....	1,174	India Rubber.....	1,307	Electrical Matl.....	223
Tinware.....	38	Nickel Oxide.....	284	Sandpaper.....	22
Fuse.....	26	Sewing Machines.....	552	Woodware.....	9
Hollowware.....	12	Sandpaper.....	237	Metal Goods.....	11
Sandpaper.....	39	Crucibles.....	65	Brass Goods.....	24
Grindstones.....	20	HULL.—Total, \$229,930.		Plated Ware.....	7
Railroad Material.....	48	Doors.....	\$750	Showcases.....	36
Machinery.....	2,085	Rubber Goods.....	1,223	Refrigerator.....	30
Dynamite.....	500	Woodware.....	153	RIGA.	
Agricuilt. Impts.....	90	Hardware.....	3,951	Pumps.....	\$68
Emery Wheels.....	51	Agricuilt. Impts.....	1,184	ROTTERDAM.—Total, \$244,163.	
Freezers.....	14	IPSWICH.		Agricuilt. Impts.....	\$1,202
Electric Material.....	490	Eyelets.....	\$473	Carts.....	118
Brushes.....	152	LEICESTER.		Pumps.....	230
		Woodware.....	\$40	Hardware.....	108
		Manufd Wood.....	56	Copper.....	31,300
		LEITH.—Total, \$85,799.			
		Agricuilt. Impts.....	\$42		
		Hardware.....	15		

ST. PETERSBURG.—Total, \$3,000.			
Agricult. Impts.			\$2,140
STOCKHOLM.—Total, \$2,291.			
Water Wheel			\$250
SAMSOON.—Total, \$373.			
Machinery		\$48 | Pump	\$225
ST. HELENS.			
Clocks			\$411
SAN DOMINGO.—Total, \$14,826.			
Manufd Iron	\$187	Baby Cabs	20
Lamp Goods	30	Packing	20
Scales	44	Hardware	227
Organs	22	Manufd Wood	16
Woodware	5	Wheels	24
Electrical Matl	12	Rubber Goods	73
Wagons	16	Twine	21
Nails	188	Grindstones	27
Carriage Matl	17	Tinware	30
Agricult. Impts.	13	Sewing Machines	42
Iron	47	Tanks	5,537
Machinery	60		
TREBIZOND.—Total, \$285.			
Hardware		\$43 | Manufd Iron	\$25
URUGUAY.—Total, \$30,148.			
Hardware	\$709	Lamp Goods	\$37
Manufd Wood	18	Sewing Machines	854
Twine	470	Pumps	54
Nails	181	Well Supplies	326
Plated Ware	50	Cartridges	442
Firearms	813	Machinery	675
Agricult. Impts.	4,814		
UTRECHT.			
Organs			\$300
UNITED STATES OF COLOMBIA.—Total, \$23,582.			
Manufd Iron	\$481	Manufd Wood	\$9
Percussion Caps	55	Lamp Goods	138
Crucibles	3	Shot	65
Scales	90	Iron	150
Lock Boxes	315	Plated Ware	72
Brushes	18	Clocks	188
Boiler Comp	309	Agricult. Impts.	15
Yellow Metal	147	Sewing Machines	91
Packing	21	Tinware	43
Cartridges	34	Woodware	103
Machinery	124	Rubber Goods	230
Trunks	6	Pipes	36
Hardware	287	Saws	116
VIENNA.—Total, \$10,475.			
Agricult. Impts.		\$5,748 | Sandpaper	\$352
VENEZUELA.—Total, \$101,549.			
Lamp Goods	\$366	Manufd Iron	\$527
Machinery	1,028	Sewing Machines	694
Agricult. Impts.	56	Electrical Goods	599
Scales	481	Twine	468
Tinware	22	Woodware	33
Sandstones	5	Showcase	344
Trusses	12	Brass Goods	109
Letter Press	13	Watches	110
Emery Cloth	12	Saws	10
Slates	34	Fuse	7
Cutlery	15	Candlesticks	11
Iron Safes	300	Firearms	942
Baby Carriage	26	Clocks	53
Wheelbarrows	65	Railings	225
Cutlery	74	Refrigerator	24
Rubber Goods	2	Pumps	29
Brushes	10	Wire Goods	4
Velocipedes	10	Traveling Bags	45
Trunks	33	Boiler Dome	120
Iron Pipe	20	Zincs	7
Hardware	1,608		

Paints and Colors.

It should be understood that the prices quoted in this column are strictly those current in the wholesale market, and that higher prices are paid for retail lots. The quality of goods frequently necessitates a considerable range of prices.

There have been no striking developments in any branch of the market for Paints or Colors. Weather conditions still stand as an obstacle in the way of building operations and to outdoor work generally, thus keeping the spreading of Paint in that line down to winter season proportions, and nothing more than routine demand has been experienced for special sorts used by car and vehicle builders, &c. However, the prospects for an early and brisk spring season trade are looked upon as being decidedly promising and that, along with generally favorable outlook in the market for nearly all crude materials, prompts a tendency toward decided firmness on prices. No changes of importance have been reported during the week under review.

White Lead.—The situation is without change further than in the fact that some few "outside" corrodors who latterly

booked quite a good many orders at prices $\frac{1}{2}\phi$ @ $\frac{1}{3}\phi$ under the prices quoted by the National Lead Company are less anxious for business. In other words, competition has moderated perceptibly and the only real contest at present is between corrodors and manufacturers of the better class of Mixed Leads. Even in this competition there is nothing really formidable or out of the usual line, and the corrodors are therefore quiescent, calculating confidently upon a larger business in most sections of the country during the spring and early summer months. It may be noted as a matter of at least passing interest that the National Lead Company, otherwise known as the "Lead Trust," is about to reorganize under the laws of the State of New Jersey, owing, as alleged, to greater advantages than those permitted by the laws of New York State, under which the change from a "trust" to an incorporated company was made some time ago.

In view of some misunderstanding regarding prices for the goods, we beg to state that Chas. Richardson & Co., Boston, quote Forest River strictly pure Lead, made in Salem, Mass., and F. W. Gerdes & Bros', strictly pure Lead, made in Pittsburgh, Pa., at $6\frac{1}{2}\phi$ @ 7ϕ in lots of 500 lb and upward. These Leads are ground in pure Linseed Oil and not by the pulp process.

Red Lead and Litharge.—Aside from filling routine orders for moderate-sized lots, there has been very little doing and the demand at present is tame. Nothing develops in the way of unusual competition, however, and prices remain as before all along the line.

Orange Mineral.—The former line of prices prevails on domestic product, and importers' prices for foreign stock are almost stationary. Dealings are moderate at present, and the demand is wholly of a routine character.

Zincs.—In some instances manufacturers' agents report a better run of orders the past week for American Oxide, and, upon the whole, the market appears to be in very good shape, with the old line of prices adhered to. Imported Zincs remain very quiet, but prices for those as well as for the domestic article are without radical change.

Colors, &c.—Colors for grinders' use have been taken to a fair extent for near future delivery at practically former prices, and general market conditions remain about as they have been for some time past. Dry Colors for house painters' use, &c., are also without noteworthy change, and nothing new has developed in Oil Colors or ready-mixed Paints. The upward tendency of the market for Oil, however, tends to restrain competition in the latter lines for the time being.

Miscellaneous.—In the absence of any important addition to supplies or more urgent demand, the position of the market for Block Chalk remains unchanged. On local brands of Whiting prices are steady, although demand is slow at present, and the same may be remarked of Putty. Barytes have been taken to a very fair extent for near future delivery, chiefly at old prices, and in China Clay, Terra Alba and Talc about the routine business has been effected at practically old rates.

Oils and Turpentine.

The feature of the Oil market is a more or less sharp advance in prices and general buoyant tone that eclipses anything that has been experienced in many years. Under the stimulating influence of the excited condition of the market for hog products, prices for Lard and inferior Greases have advanced to a level that affects everything in the line of Lubricants and Soap-making material. This in turn has affected various other Oils, while higher cost of Lin-

seed has stiffened the market for the product thereof. Speculation has played some part in certain lines, but natural conditions indicate that the advances that have taken place rest on very solid foundation and that any considerable reaction is unlikely to take place in the immediate future.

Linseed Oil.—Advices from the West noting higher prices for Seed have prompted freer purchases by large consumers and jobbers in this city and immediate vicinity. In several instances orders have been placed involving deliveries extending over a period of two or three months, and upon the whole the volume of business would appear to have been considerably ahead of that of any preceding week thus far this year. Naturally the market has gained tone and is very firm at this writing.

Cotton-Seed Oils.—In this line there has been a very lively experience and not a little variety. Heavy purchases by Lard refiners have served to promote some excitement, while the speculative interests have added fuel to the flame by more or less extensive purchases. Word comes from some of the primary sources of supply that attractive prices have brought out a better supply of seed, and that the production of Oil will therefore be larger than seemed probable a few weeks ago. There are also hints of supplies being brought this way from European markets. These circumstances have had no weight thus far, however, since the demand proves sufficient to absorb about all the Oil that is within reach at present prices. Sales have been made at from 43ϕ up to 50ϕ for Prime crude, 49ϕ up to 55ϕ for Prime Summer Yellow and corresponding prices for other varieties. It is estimated that at least 10,000 barrels, probably 15,000 barrels, have changed hands in a speculative way. Toward the close of the week prices advanced suddenly and in a very decided manner under influence of quite heavy buying orders here and at the South, together with more or less speculative manipulation. Crude went to as high as 55ϕ and Summer Yellow to 60ϕ on actual sale, while those prices were subsequently bid.

Lard Oil.—Prime city product has advanced to \$1 per gallon, and the lower grades are proportionately higher. This remarkably high cost naturally causes consumers to be more than ordinarily economical and employ substitutes to the greatest possible extent, but pressers nevertheless have found outlet for all the Oil they have been able to produce and manifest reluctance to take orders for greater quantities than can be made from the raw material now on hand. The advance, as noted above, is due chiefly to the excited condition of the market for hog products.

Fish Oils.—A line of 120 barrels crude Menhaden Oil has been sold at 40ϕ , the highest price touched thus far this season, and available supplies are moderate. The Pressed and Bleached products are higher as a matter of course, and not offered very freely. Importations of Canadian Porpoise Oil for tanning purposes have been attracted by the high cost of Menhaden products, and sales are making at from 44ϕ up to 48ϕ , as to quality. In the New Bedford market there have been sales of crude Sperm Oil at as high as 85ϕ , and holders of the few thousand barrels remaining unsold now ask 90ϕ . Manufactured products are higher in consequence and offered sparingly. Seal Oil has come into more prominence and realized 45ϕ @ 48ϕ . No radical change on Cod or Whale Oils has taken place, but the market for both commodities is decidedly firm.

Spirits Turpentine.—Business has been of routine character in this market, and with no really new developments at the primary sources of supply prices have remained almost stationary.

Unique Pickle Grabber.

Unique Mfg. Company, 35 Murray street, New York, are bringing to the notice of the trade a novel style of pickle tongs, as illustrated herewith. It is a silver-plated device, 8 inches long, with a stationary spoon and a movable claw, the latter actuated by a spring. After introducing the grabber into a bottle, as shown in Fig. 2, the knob at the top is pressed, when the movable claw opens; when the pressure is removed it automatically grasps the pickle. Pressing the knob again releases the pickle without injury to it, while the spoon serves the liquor. The prodding or stabbing of pickles with a fork is thus superseded by this unique contrivance. It may be utilized for serving sardines, oysters, pickles, olives, sliced cucumbers, &c. This is the first of a series of unique servers which will be offered by the company. Sugar and bonbon servers will be ready shortly, followed by sardine and asparagus servers,

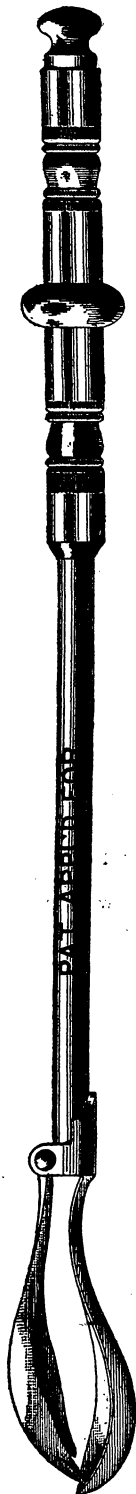


Fig. 1.—Unique Pickle Grabber.



Fig. 2.—Pickle Grabber in Use.

each to be distinctively different in design and adapted to the purpose intended.

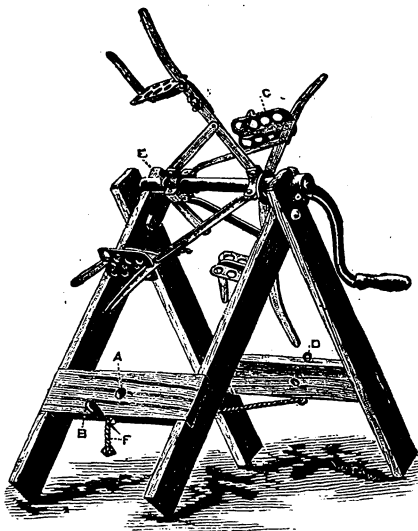
Hero Sheep Protector.

A. F. Shapleigh Hardware Company, St. Louis, Mo., are offering this device, which is made of wire links, each link having two sharp points projecting outward, and is designed to be worn on the neck of the sheep. Each collar consists of 18 links, and any link can be removed or more links added in a moment's time, thus adjusting the collar to the size of the sheep's neck. The protector is made of galvanized iron, so as not to wear out or

rust, and does not injure the sheep, as the wool completely covers the collar, being from 2 to 7 inches longer than the projections. Dogs or other animals attacking sheep at the neck come in contact with the sharp points of the collar.

The Buchanan Combined Wire Reel.

The Buchanan Fence Company, Smithville, Ohio, are manufacturing the wire reel herewith shown. It is made of malleable iron, and when not in use, or when being taken from place to place, it can be folded so as to occupy a small space.



The Buchanan Combined Wire Reel.

The reel is adjustable, so it can quickly be made to fit any sized coil of wire, and is used for taking wire off of coils and also for coiling wire. Wire may be taken from larger coils and put on smaller ones, or wire can be taken from a fence and put on coils, making a coil of any size desired. It avoids tangling and ruining coils of wire, provides a practical way for retailing wire and leaves the original coil in good condition, and by its use allows any one handling wire to do it in a satisfactory manner. It is recommended by the makers for the use of hardware dealers, fence builders, farmers, &c.

The Jack Frost Freezer.

The Jack Frost Freezer Company, 29 Murray street, New York, are offering an

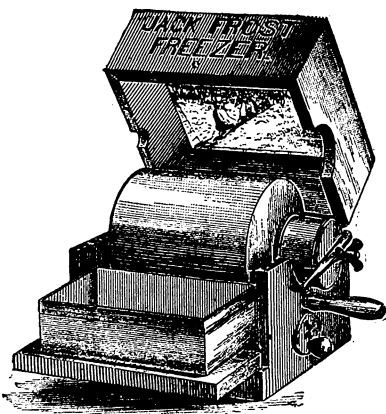


Fig. 1.—The Jack Frost Freezer.

improved form of their freezer, as illustrated in Figs. 1, 2, 3 and 4. Fig. 1 shows the article complete and ready for use. Fig. 2 represents the cylinder with

the metal cap removed. In use this cylinder should be carefully packed with broken ice and rock salt, rammed solid with a flat wooden stick, using about one part salt and six parts of ice. When full the cap may be put on, a close joint being assured by using the rubber ring furnished. The handle is then attached and held firmly in place by means of the thumb

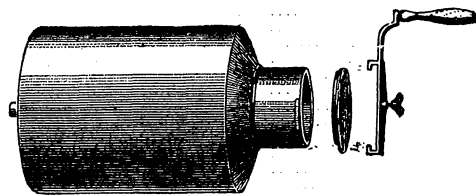


Fig. 2.—Cylinder with Cap and Handle Detached.

screw in the center. The mixture is then poured into the pan shown in Fig. 3, this pan being rounded at the bottom permitting the entire contents being used. By turning the crank very slowly the intense cold generated by the mixture of ice and salt will cause the liquid to adhere to the cylinder in a frozen state. It may be said the cylinders are now made much larger in proportion to length than formerly. At

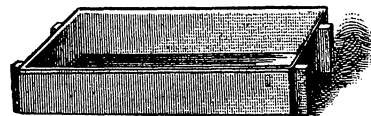


Fig. 3.—Pan with Rounded Bottom for Holding Mixture to be Frozen.

the ends of the box, as seen in Fig. 1, are knobs for raising and lowering of the pan. Fig. 4 shows the front or repacking box, which can be used to catch the frozen cream scraped from the cylinder by a hard wood implement sent with each freezer, so made that it may be attached readily to the repacking box, causing the material to pass into the receptacle as the crank is

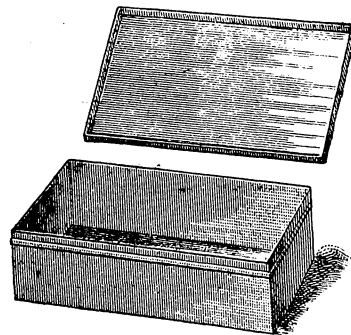


Fig. 4.—Front or Repacking Box.

turned. These freezers are inclosed in varnished antique oak boxes, having a drop front which can be used as a shelf for the repacking box, or if desired to accumulate the entire contents of the pan on the cylinder before removing the box may be closed tight. If the cream is prepared hours before it is wanted, the box when packed may be covered with the tin top, the whole wrapped in a damp cloth and packed in ice and salt until needed. The manufacturers remark that by employing this method various mixtures may be frozen in less than 30 seconds.

Eraser and Pen Showcase.

The Miller Bros. Cutlery Company, New York office, 325 Broadway, manufacturers of pocket knives, erasers and steel pens, are offering to dealers an attraction, as here illustrated, in the way of a showcase for exhibiting samples of erasers and containing a stock of pens for

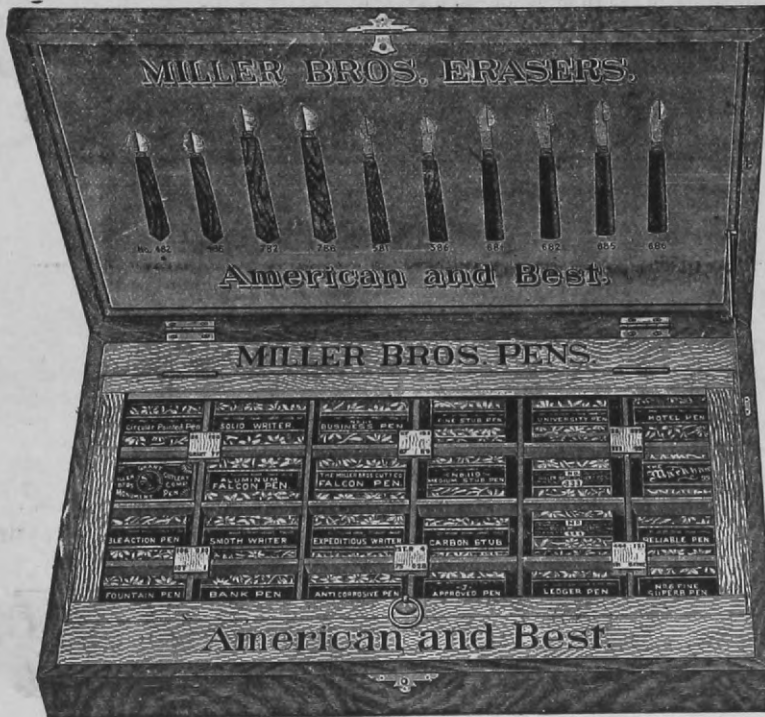
the case itself, are not charged for, while a liberal discount from the list price of the pens is made.

Ratchet New Standard Bit Brace.

Chantrell Tool Company, Reading, Pa., and John H. Graham & Co., 113 Cham-

The Comstock Pipe Cutter.

H. Comstock & Co., Fulton, N. Y., are offering this cutter, as herewith illustrated. It is made from steel drop forging, with all parts interchangeable. The cutter wheels are forged from fine cast steel, turned and tempered, and are fitted to the



Showcase for Erasers and Pens.

retail purposes. This case is of solid quartered antique oak, and the joints are mitered and dovetailed. It is 20 inches long, 11½ inches wide and 3 inches deep, the fittings are of brass, including the hinge for maintaining the cover raised when so desired. The interior lining is of bass-wood, and both interior and exterior are well varnished, the pens being covered with glass for protection. The space is

divided into 24 compartments, into which the pen box may be placed or its contents emptied. At the intersection of each partition is placed a wood square with a pen number in each corner for the corresponding section. This square may be changed at will, if necessary, as two grooves are cut underneath, crossing each other at right angles, permitting of the squares being placed at any intersection. As sent out the combination has been so arranged that when the pens are emptied the various colors, blue, brown, bright steel, &c., harmonize and produce a pleasing effect. The erasers, which are mounted in cocoa, white bone, ebony and rubber handles, being intended as samples, together with



Ratchet New Standard Bit Brace.

The plate on the under side of the head has an oil hole and the brace throughout is efficient and durable. The goods are packed in wood boxes with slide covers.

The Southington Cutlery Company, Southington, Conn., have recently sold their Silver-Plating business to the Meriden Britannia Company, including machinery, tools, stock, &c., for the manufacture of Silver-Plated Hollow Ware. The purchase will be shortly transferred to Meriden. This will not in any way affect the production of other lines of goods made by the Southington Cutlery Company.



Fig. 1.—The Comstock Pipe Cutter.

cutter block with a strong steel screw that can be removed with an ordinary screw driver in case of breakage and a new wheel inserted. The tool is provided with an abrading or scraping attachment that cleans the obnoxious burr and the hard

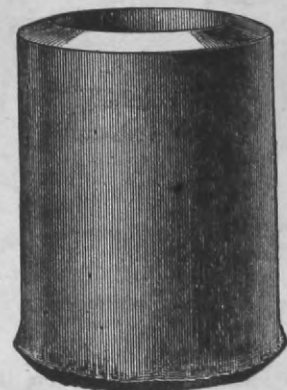


Fig. 2.—Showing the Work Done.

rough scale that forms when cutting. In Fig. 2 the upper end of the pipe represents the clean bright surface resulting from the use of this tool, ready for the threading dies. The point is made that the cutter is light and strong, and made in three sizes, to cut pipe from ½ to 4 inches.

Whiteley Lawn Mowers.

Wilson, Whiteley & Co., Springfield, Ohio, are offering mowers shown in Figs. 1 and 2, which are constructed without pawls, springs or pins. In Fig. 1 is shown a front view of their mower with standard 8-inch wheels, and Fig. 2 represents their

connecting the driving wheel to the housing, with the nut and washer removed from the bolt. The connection of the cutter bar for the lower knife to the housing is shown in Fig. 8, also the means for adjusting the knife to the reel.

In the construction of this machine, spiral gear wheels and pinions are used to drive the reel in connection with a ratchet-faced clutch connected to the reel shaft similar to the ratchet face of the pinion, as seen in Fig. 7. By the use of these spiral gears the running of the driving wheels of the machine forward moves the pinions in on the shaft engaging the ratchets of the pinion and clutch to drive the reel; and

and is threaded on the end for a screw nut, Fig. 3, which, when screwed up against the end of the hub, pulls the slotted box into the tapered hole in the hub, reducing the size of the hole for the reel shaft, making an adjustable box for taking up the wear, and at the same time always retaining the reel shaft central in the bearings.

The construction and adjustment of the cutter-bar and stationary knife to the reel blades, Fig. 8, is made in a most substantial manner by the use of heavy set screws, which are adjusted to set and secure in



Fig. 1.—Whiteley Lawn Mower, 8-Inch Wheels.

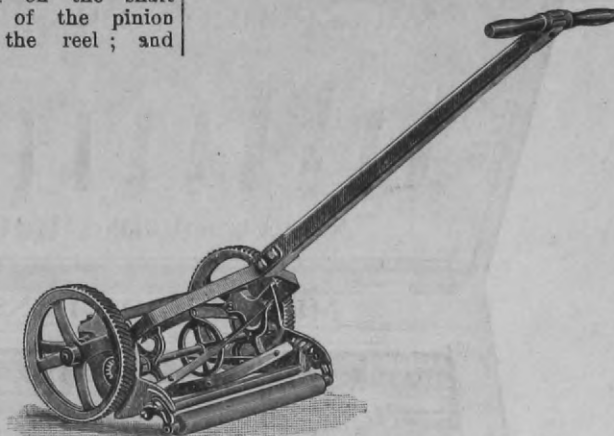


Fig. 2.—Whiteley Lawn Mower, 10-Inch Wheels.



Fig. 3.—Spiral Pinion and Clutch.

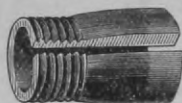


Fig. 4.—Tapered Slotted Adjustable Box.



Fig. 5.—Adjusting Nut.

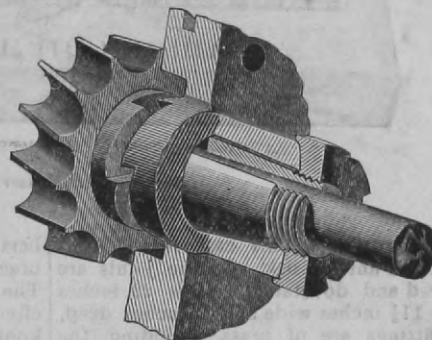


Fig. 6.—Pinion, Clutches, Box, Nut and Section of Reel Shaft.

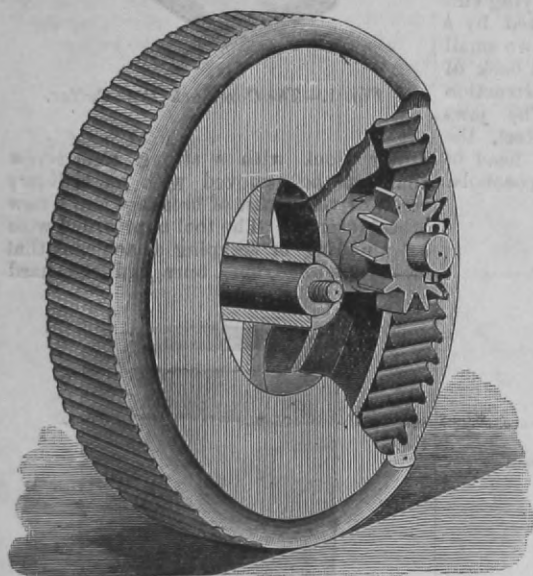


Fig. 7.—Driving Wheel and Connections.

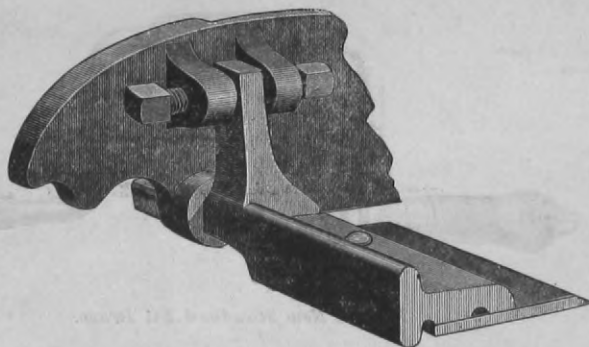


Fig. 8.—Adjustable Cutting Bar.

high 10-inch wheel mower from the rear, the working parts being of the same construction in both these machines. Figs. 3, 4 and 5 represent the clutch, pinion, tapered slotted adjustable box or journal bearing and the adjustable nut for the same, all disconnected. Fig. 6 shows the spiral pinion with clutch, also clutch for reel shaft, and the slotted tapered self-adjusting box for reel shaft, with adjusting nut and section of the reel shaft, all connected together. In Fig. 7 are shown the spiral gear with pinion clutch and stud

when the driving wheels are stopped or moved backward, the pinions are moved out on the reel shaft, so that the ratchets are disengaged, securing, it is stated, a perfect and noiseless movement and entirely dispensing with pawls, pins or springs.

The reel shaft is supported and adjusted by means of a brass-slotted box, which is turned tapered on the outside and fits into a bored tapered hub in the housings of the machine. The slotted box, Fig. 4, extends through the hub of the housings

position the arm of the cutter bar, and these set screws are so located and constructed that they can be adjusted by the use of an ordinary wrench.

In the construction of the handle and handle bar, the handle bar is slotted and beveled to fit beveled gains in the handle, so that when the two parts are connected together they are firmly wedged and held in position by the use of a clamp bolt, which passes through the handle and handle bar. Both mowers are made in 14, 16 and 18-inch cut.

The Gate City Filtering Block.

The accompanying illustrations represent the Gate City natural porous filtering stone, made from the solid rock into a hollow block 5 inches high by 4 inches in diameter, and the uses to which such hollow block is put as a filter. It is manu-

easily and quickly removed from the drip tube for cleaning, which the manufacturers advise should be done daily or oftener, according to the condition of the water, as an inspection of the block will

water, if foul, turbid or otherwise. The outside jar, Fig. 3, is made both in porcelain and stone ware, and is also made without the ice guard. In Fig. 4 is shown an arrangement of wooden tubs or pails for those who prefer a less expensive filter. Fig. 5 represents the filter reversed in an ordinary water pail and used in connection with a syphon, and in this way, we are advised, it will filter 4 gallons of water daily. Several blocks can be used at the same time if large quantities of water are required. The Gate City filtering stone has been in use in various forms for the past 12 years, and with a view of introducing the filter more universally the manufacturers have placed it at a price within the reach of all. Thus the filtering block is sold

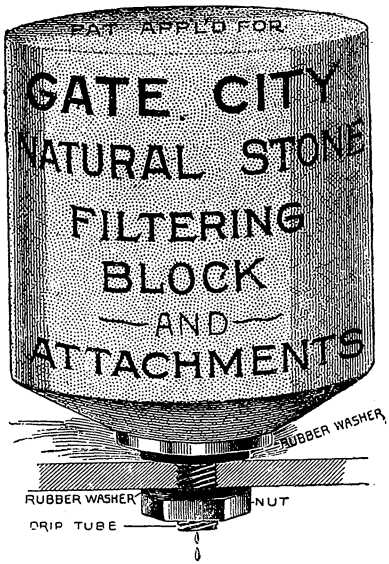


Fig. 1.—The Gate City Filter.

factured by the Gate City Stone Filter Company, 35 Murray street, New York. Emphasis is laid on the fact that it is made of natural rock and not of artificial stone. The filtering block is shown in Fig. 1 and the attachments and methods of use in Figs. 2, 3, 4 and 5. A rubber bushing or ring is cemented into the

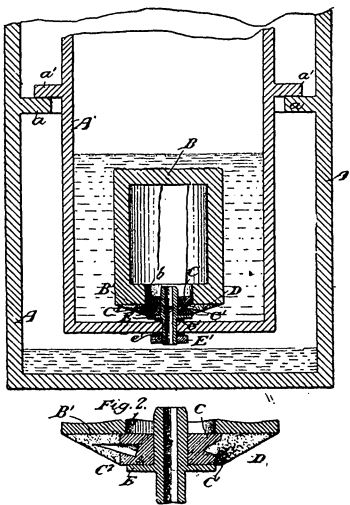


Fig. 2.—Detailed View of the Filter.

bottom of the block, and fits water tight on a drip tube fitted into the bottom of a water reservoir. A detailed view of the position of the filter, also of the manner of fastening the rubber bushing and drip tube into the filter, is given in Fig. 2. As shown in Fig. 3, the water is poured around the filter and passes through the porous sides of the stone block to its interior, and thence down through the drip tube to the receptacle below, leaving on the outside surface of the filter block the foul properties of the water, including, it is claimed, disease germs, decayed vegetable and animal matter, as well as miscellaneous filth found in city and in most spring water. An advantage of this construction is that the filtering block can be

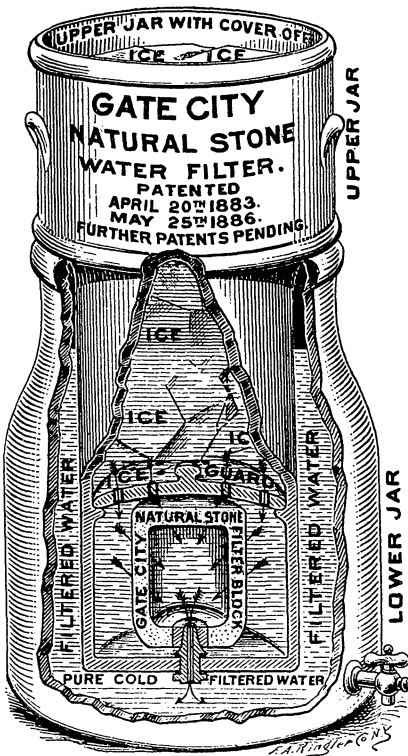


Fig. 3.—Filter and Earthen Jar.

determine, by rinsing and brushing the surface of the stone with the brush provided until all the foul accumulations are removed. The point is made that in brushing the block an imperceptible amount of the surface of the stone is removed with the filth. Thus the surface is constantly renewed and the pores opened for continued filtration. It is stated that one of the peculiar properties of the Gate City stone is that all matter is excluded

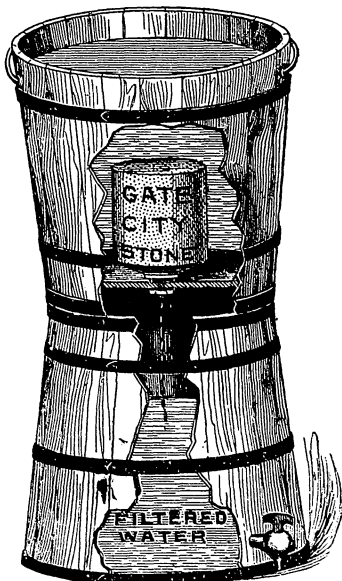


Fig. 4.—Filter in Use.

and goes no further than the surface, and that the interior will, after years of use, be found as pure and white as at first. Each block will yield from 4 to 5 gallons of filtered water daily, if kept clean and the jar filled with water to keep up the pressure, but much depends upon the kind of

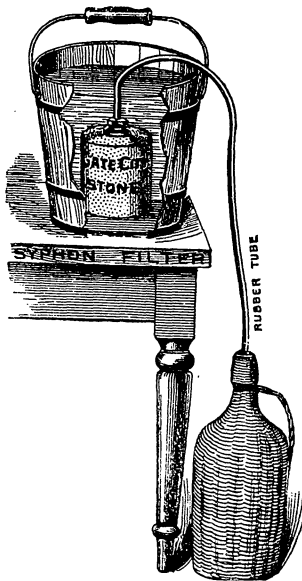
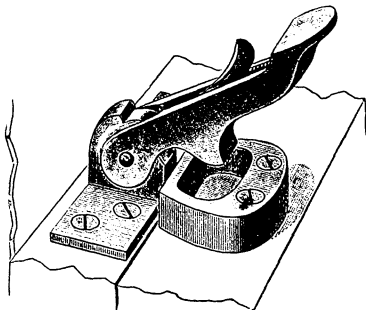


Fig. 5.—As Used with a Syphon.

for \$2, with attachments as shown, Fig. 1. The company emphasize the importance of having pure water and the efficiency of the Gate City filtering stone in securing it.

The Bennett Sash Fast.

The accompanying illustration is of a sash fast being introduced by the Bennett Mfg. Company, 19 Pearl street, Boston. The fastener works on the principle of a lever, and does not depend upon the meeting rails being level to insure its



The Bennett Sash Fast.

working. It is stated that it will draw the upper sash up or push the lower one down for a distance of almost an inch. This does away with the inconvenience of using a pole or getting on a chair to bring the sash in place when they are without cross bars. It is claimed that the fastener brings the sash both into place and firmly together, preventing the admission of dust or cold. Provision is also made for locking the windows and yet allowing them to be slightly open, this being referred to as an advantage, should there be ice under the sash or should they be swelled.

Diamond Bolt Screen Door Catch.

Sargent & Co., New Haven, Conn., and New York, are putting on the market the door catch illustrated herewith, with night work. The cuts are full size, and show knob and escutcheon for doors $\frac{7}{8}$ to $1\frac{1}{8}$

time. They are made in 7 widths, from $\frac{1}{2}$ inch to $1\frac{1}{4}$ inches, and can be made any width or length desired.

Revere Rubber Company, 64 Reade street, New York, very appropriately embody the name and picture of Paul Revere

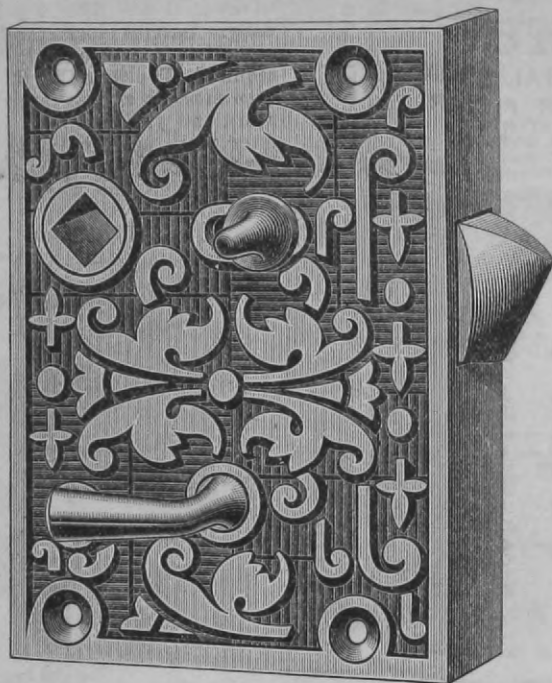
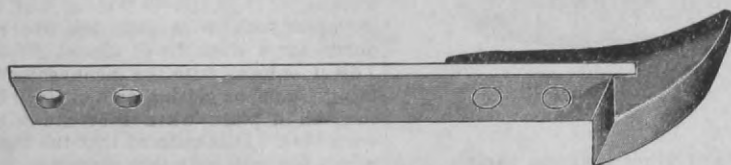


Fig. 1.—Diamond Bolt Screen-Door Catch.

inches thick. The lock has an anti friction bolt, reverse bevel with flat strike, packed with screws to match. The peculiar formation of the latch bolt, together with the strike, has the effect to overcome friction, thus enabling the catch to act quickly and to close with remarkable ease. The locks are each furnished with two nickel plated flat steel keys, bronze metal stop knob, and made in various styles of finish.

Nickerson's Tailboard Spring.

New England Specialty Company, North Easton, Mass., are putting these springs on the market, as illustrated herewith. They are made from crucible steel, oil



Nickerson's Tailboard Spring.

tempered, in two parts, as shown in the cut. The makers claim that they will not bend or twist and that they will come back to their place on the tailboard each

the historical scene of Paul Revere on horseback watching for the signal lights in the Boston church steeple before setting out upon his ride through the gloom

and the night. A bird's eye view of the company's works is given at the right-hand corner of the card, while date cards

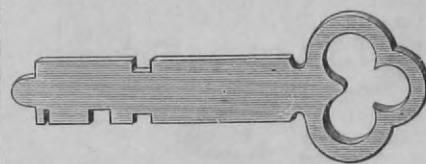
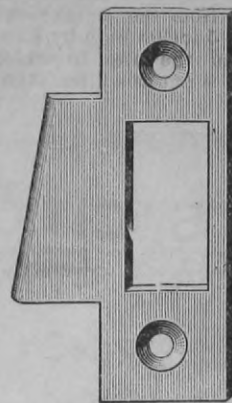


Fig. 3.—Diamond Strike and Key.

are scattered at the bottom and to the left of it.

Perfected Automatic Hinge.

The accompanying illustrations represent a hinge for blinds and screen doors, being put on the market by Whipple & Streeter, Greenfield, Mass. The hinges are made of malleable iron with a substantial japanned coil spring, and will hold blinds or doors either open or shut, or



Fig. 1.—Perfected Automatic Hinge for Wood.

half open, without any other catch or fastening. It is automatic in its action, and prevents the rattling and slamming of blinds, and may be placed upon old blinds without interfering with hinges already in use. By removing the pin the hinge is made either right or left hand, or the blind



Fig. 2.—Perfected Automatic Hinge for Brick.

or door can be taken off without removing the screens. The hinges are made in three styles—surface, flush and brick. The manufacturers claim that the hinges are strong and durable; that there is no wear to the angles; that in flush blinds they do not interfere with moldings, and that no other fixtures than the hinges are required, either on wood or brick buildings.

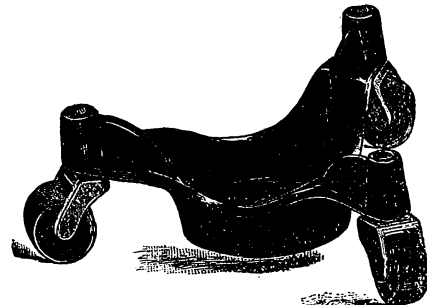
Safety Razor Stropping Machine.

E. Lothar Schmitz, 92 Reade street, New York, is introducing a machine, as here illustrated, designed for mechanically stropping safety razors, the object sought being to accomplish it expeditiously, at the same time obtaining the best results without professional skill. The handle of the machine is $2\frac{1}{4}$ inches long, of wood, black enameled. The frame, made of spring brass, nicked, is $2\frac{1}{4}$ inches wide inside. The roller is rosewood, $2\frac{1}{4} \times \frac{1}{2}$ inches, and the gears of steel. In operation the razor blade is inserted in the spring holder and one end of the swing strop, smooth side downward, is passed through the opening between the friction roller and the frame holder, as shown in the cut. The machine is then moved forward and back, pressing lightly on the strop, when the friction will cause the blade to be automatically reversed, turning on its back, thus pressing the edge against the strop. The strokes may be long or short, quick or slow, the blade turning whenever the direction of stroke is changed. The manufacturer refers to this method as giving to the blade a more uniform and keener edge than can be obtained in the usual way, adding that it is quite impossible to injure the strop. In the advertising columns of this issue will be found full-size cuts of

handle, a scraper, box of rosin and a bundle of wire solder, accompanied with full directions how to use them, all put up in a neat heavy paper box. They are designed for family use. The goods can be obtained in full sets or in parts.

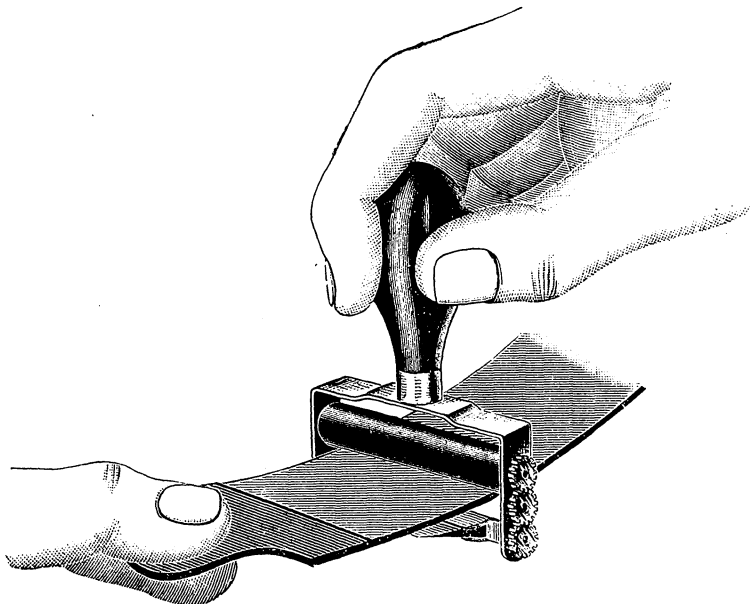
The Harper Stove Caster.

Harper Mfg. Company, Peoria, Ill., are offering this caster, as herewith illustrated.



The Harper Stove Caster.

Four of these casters form a set, weighing about 12 pounds to the set and designed to carry 2000 pounds. They are for use under sample stoves in the store, and under stoves in the blacking room. As one per



Machine for Stropping Safety Razors.

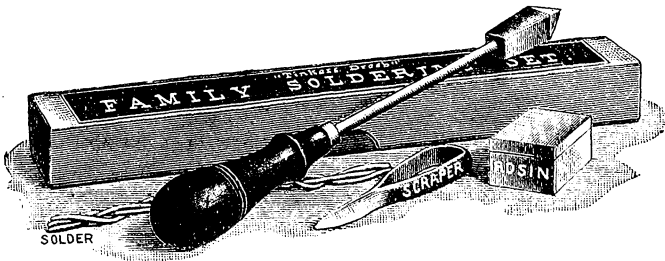
the Fox safety razor made by this house, fully illustrating the goods and showing the mode of using the razor.

Tinkers' Dread Soldering Set.

A. S. Henn & Co., 11 Artisan street, New Haven, Conn., and James P. Ken-

son can place them under a stove and move it with ease, the casters are well adapted for use in private families for moving stoves when taking up carpets, and for storing stoves.

With the compliments of Geo. M. Scott & Co., 168 Main street, Salt Lake City,



Tinkers' Dread Soldering Set.

worthy, 96 Chambers street, New York, are offering the above goods, as shown in the accompanying illustration. The set is made up of a soldering iron with enameled

Utah, is sent a handsome metallic end hanger, to the lower part of which are attached calendar leaves for 1893. The larger portion of the card is taken up

with the head and shoulders of a young lady, done in colors, of more merit than usually found in this class of advertising. Under the firm's name at the top is a business card calling attention to their stock of hardware and metals.

Refrigerator Trap.

The Challenge Corn Planter Company, Grand Haven, Mich., who manufacture largely refrigerators, sideboards and ice chests, are now making their refrigerators with a drip cup or trap, as shown in Figs. 1 and 2, which are half-size cuts. The drawings represent the cup fastened to a section of the bottom of the refrigerator. The article is made of cast iron and

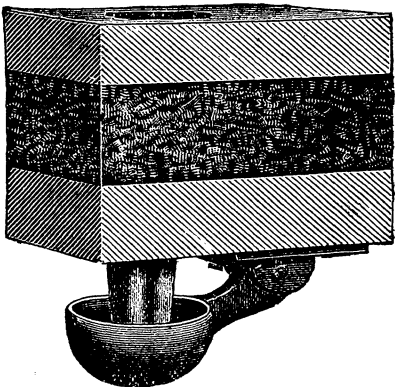


Fig. 1.—Drip Cup in Position.

japanned. There is a plate about $1\frac{1}{2}$ inches square to which the arm of the cup is riveted, there being a stout flat steel spring between the plate and the arm for the purpose of keeping it rigidly in position, at the same time allowing of its being dropped occasionally for cleaning the cup or the pipe. The plate is secured to the refrigerator by means of four screws. Fig. 1 illustrates the trap in

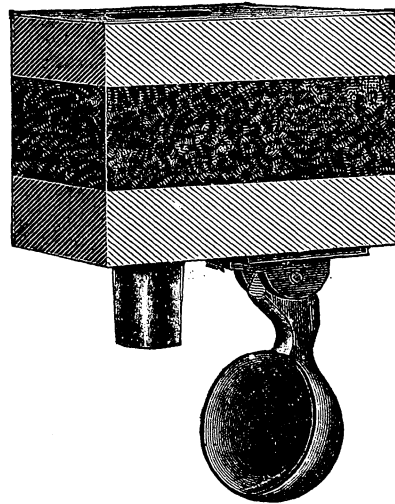


Fig. 2.—Drip Cup Depressed for Cleaning.

position, the waste pipe running into it. When filled by the drip it constitutes a trap, and prevents hot air or odors of any kind accumulated in the confined space underneath from unnecessarily wasting the ice or contaminating food, more particularly milk and butter, which are peculiarly susceptible to such influences. This is intended to supplant the ordinary zinc trap usually imperfectly fitted and more often found off the pipe than in its place. Fig. 2 shows the cup depressed for cleaning either that or the pipe.

Motley's Adjustable Sash Holder.

Peter Motley, 750 South Broad street, Philadelphia, Pa., is putting the above article on the market, as illustrated in Fig. 1. It consists of a brass sleeve $1\frac{1}{2}$ inches long, threaded inside to receive a



Fig. 1.—Motley's Adjustable Sash Holder.

screw with a head on one end. On the screw is a duplex screw, which is used for increasing or decreasing the tension of the spring. The holder has an adjustment in length from 2 to $2\frac{1}{2}$ inches, and is applied as shown in Figs.

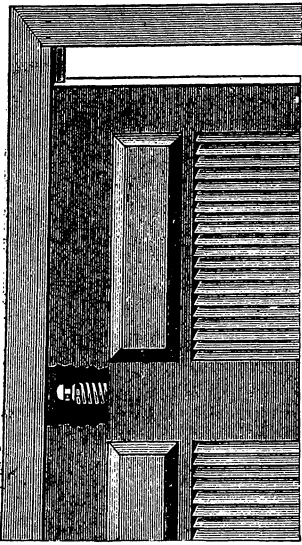


Fig. 2.—Sash Holder Applied to Sliding Blinds.

2 and 3. The spring is made of the best tempered piano wire, and the balance of the holder of brass. The special features of the holder are its adjustability

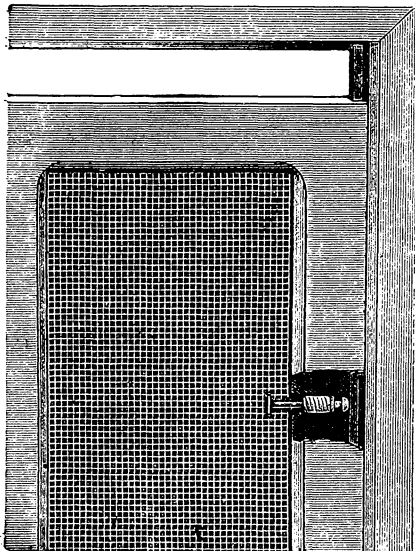


Fig. 3.—Sash Holder Applied to Window Screen.

to any pressure, heavy, light or variable, the friction being regulated by the duplex adjustable screw; its simplicity and durability; the spring, whose temper cannot be affected, it is stated, by any degree of friction; the ease with which it is applied, requiring no nails, screws, &c., and the great amount of power in a small place. In general use the holder is fitted into the edge of the frame, but it is sometimes

preferably fitted into the sash bead, guide-way or jamb. It may also be used fitted into either surface of the frame to take up looseness or to avoid rattling. In sliding screens or sliding blinds the holder allows them to be put in or removed at any point of the slide, at the same time avoids sticking. Another advantage is that the runways may be made the full height of the sash. The holder is also used for holding stationary screens and blinds in place. The holder is made in three sizes—small, medium and large, the medium size being the one most used. They are also made to order in lengths $1\frac{1}{2}$ and 2 inches long, and plated with gold, silver, bronze, &c.

Oil, Gas and Gasoline Cooking Utensils.

John B. Harker & Co., Minneapolis, Minn., are putting on the market cooking utensils particularly adapted for oil, gas and gasoline stoves, but also for use on cooking stoves and ranges. The waffle iron, Fig. 1, No. 8, fits any size stove, a 7, 8 or 9, and is simple in construction, having no surplus parts to gather and accu-

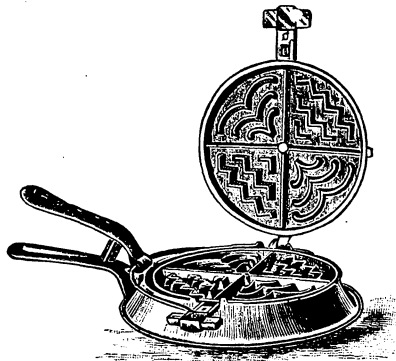


Fig. 1.—The Harker Waffle Iron.

mulate grease and dirt. It is provided with a positive lock, acting when the pan is open, preventing accidents. It is constructed inside to give a freedom to the grease in the preparation for baking and also a perfect freedom of the batter in filling, there being no cut-off by cross sections. The inside parts are made with easy draft so the cake may be easily removed, and these parts are so constructed as to insure rapid baking. The iron is provided with a grease receptacle to prevent the waste of grease and to prevent it from reaching the stove, burning and causing an unpleasant smell.

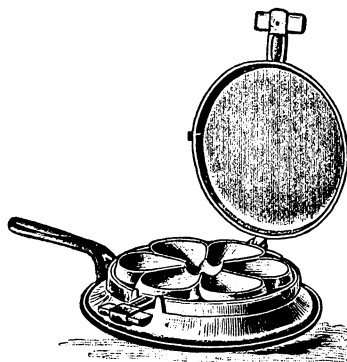


Fig. 2.—The Harker Egg Baker.

Attention is directed to the smoothness and cleanness of the casting. In Fig. 2 the waffle iron pans are removed and the egg pans are inserted in the same ring, to bake eggs on the top of the stove, the

same as waffles. After the eggs are baked sufficiently on one side the pan is reversed and the eggs allowed to bake equally on both sides. The pan is never turned but once. The griddle for baking batter cakes, Fig. 3, has a frame in the shape of a shallow bowl, with an opening in the bottom equal to the spread of a gas or gasoline burner, and equal to the opening of a medium-sized cook stove. Resting above

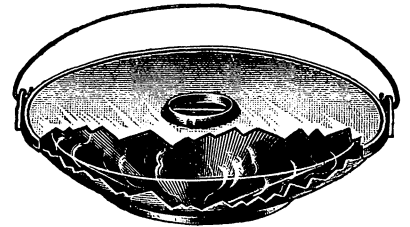
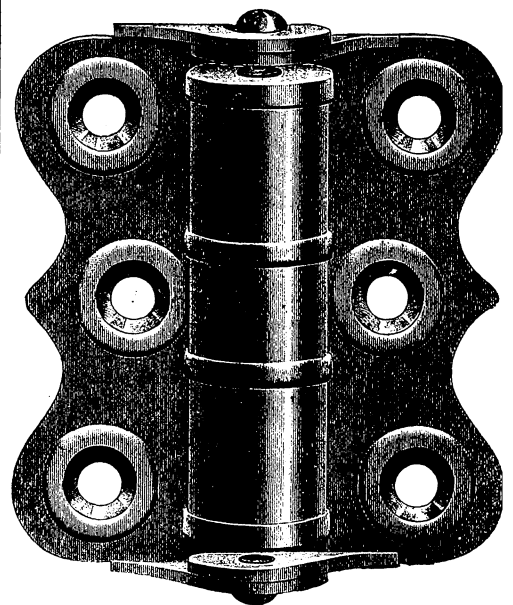


Fig. 3.—The Harker Griddle.

the frame is a funnel-shaped plate on four short legs, extending $1\frac{1}{2}$ inches beyond the opening in the frame, thus leaving an aperture of sufficient width to let the heat extend and pass between the plates toward the top surface. The top or baking plate sets into the frame and rests on a slight offset, and has a hole 2 inches in diameter in the center, so as to control the entire heat within the bowl and equally distribute it to the outer edges of the baking plate, then to the center before it can escape. The griddle is referred to as doing its work perfectly and rapidly, and as being adapted to use on a cook stove or range by removing the baking plate and using it over the open fire.

New Idea Spring Hinge No. 10.

Stover Mfg. Company, Freeport, Ill., are putting on the market an improved and more symmetrical form of their



New Idea Spring Hinge No. 10.

wrought steel New Idea spring hinge, shown herewith as their No. 10. It is referred to as embracing lasting with correct working qualities, well balanced and neat in design and having the spring covered. It is made in 3 x 3 inch size only, and ordinarily finished in japan; but if so ordered will be furnished in electro nickel and copper, Berlin bronzed, bronze plate, oxidized copper and brass, packed for the best trade.

FEBRUARY 1, 1893.

The character @ is used to indicate a range of price; thus discount 50&10@50&10&5 % signifies that the goods in question are sold at prices ranging from discount 50 and 10 % to discount 50 and 10 and 5 %.

See also Crayons

Chalk Lines—See Lines.**Chisels—****Socket Framing and Firmer**

P. S. & W.	
New Haven.	
Wetherby.	
Mis.	
Ohio Tool Co.	
Douglas.	
Buck Bros.	
Merrill.	
L. & I. J. White.	

Tanged and Miscellaneous.

Tanged Firmer.	
Butchers'.	
Spear & Jackson's.	
Buck Bros.	
Cold Chisels, # 2.	

Chucks—

Beach Pat.	
Morse's Adjustable, each.	
Danbury.	
Syracuse, Balz Pat.	
Graham Patent.	
Skinner's Patent.	
Combination Lathe Chucks.	
Universal Lathe Chucks.	
Independent Lathe Chucks.	
Drill Chucks.	
Union Mfg. Co.	
Victor.	
Combination.	
Universal.	
Independent.	

Churns—

Tiffin Union, each, 5 gal.	
McDermid Star Barrel Churn, each	
6 gal., \$2.60; 10 gal., \$2.75; 15 gal.,	
\$3.00; 20 gal., \$3.25.	

Clamps—

R. I. Tool Co.'s Wrought Iron.	
Adjustable, Cincinnati.	
Adjustable, Cincinnati.	
Adjustable, Cincinnati.	
Stearns' Adjustable Cabinet and Cor-	
ner.	
Cabinet, Sargent's.	
Carriage Makers', Sargent's.	
Carriage Makers', P. S. & W. Co.	
Eberhard Mfg. Co.	
Warner's.	
Saw Clamps, see Vises, Saw Filers'.	
Carpenter's, Cincinnati.	

Cleavers, Butchers'—

Bradley's.	
L. & I. J. White.	
Beatty's.	
New Haven Edge Tool Co.'s.	
P. S. & W.	
Foster Bros.	
Schulte, Lohoff & Co.	

Clips—

Norway, Axle, 1/4 & 5-16.	
3rd grade Norway Axle, 1/4 & 5-16.	
Superior Axle Clips, 5-16.	
Norway Spring Bar Clips, 5-16.	
Wrought Iron Felloe Clips.	
Steel Felloe Clips.	
Baker Axle Clips.	

Cloth and Netting, Wire

—See Wire, &c.

Cockeyes.

50%

Cocks Brass—

Hardware list.

Coffee Mills—See Mills, Coffee.**Collars, Dog—**

Chapman Mfg. Company.	
Medford Fancy Goods Co.	
Embossed, Gift, Pope & Steven's list.	

Combs, Curry—

Fitch's.	
Rubber, per doz.	
American Curry Comb Co.	
Kohler's Magic Oscillating.	
Kohler's Humane.	

Compasses, Dividers, &c.—

Compasses, Callipers, Dividers.	
Bemis & Call Co.'s.	
Dividers.	
Compasses.	
Callipers, Wing and Inside or Outside.	
Callipers, Double.	
Callipers, Call's Patent Inside.	
Excelsior.	
J. Stevens & Co.'s.	
Starrett's.	
Spring Callipers and Dividers.	
Lock Callipers and Dividers.	
Combination Dividers.	

Coopers' Tools—

See Tools, Coopers'.

Cord—

Common.	
Patent, good quality.	
White Cotton Braided, fair.	
Common Russia Sash.	
Patent Russia Sash.	
Cable Laid Italian Sash.	
India Cable Laid Sash.	
Silver Lake.	
A quality, White.	
A quality, Drab.	
B quality, White.	
B quality, Drab.	
Sylvan Spring, Extra Braided, White.	
Sylvan Spring, Extra Braided, Drab.	
Semper Idem, Braided, White.	
Egyptian, India Hemp, Braided.	
Massachusetts, White.	
Samson.	
Braided, White Cotton.	
Braided, Drab Cotton.	
Braided, Italian Hemp.	
Braided, Linen.	
Tate's Cotton Braided, White.	
Ossawa Mills—	
Braided, Giant, White.	
Braided, Giant, Drab and Fancy.	
Standard.	
Braided, Crown White.	
Braided, Crown Drab and Fancy.	

Wire Picture—

Braided or Twisted. 80¢ & 80¢ & 15¢
Corkscrews—See Screws, Cork.
Corn Knives and Cutters
 —See Knives, Corn.

Crackers, Nut—

Table (H. & B. Mfg. Co.)	
Blake's Pattern, # doz.	
Turner & Seymour Mfg. Co.	
Acme.	
Japanned, # gro.	
Nickel Plated, # gro.	

Cradles—

50¢ & 50¢ & 20¢ & 10¢ & 2¢

Crayons—

White Crayons, # gross.	
D. M. Stewart Mfg. Co. Metal Work-	
ers' # gross.	
D. M. Stewart Mfg. Co. Rolling Mill	
# gross.	

Crow Bars—See Bars, Crow.**Curry Combs—**

See Combs, Curry.

Curtain Pins—

See Pins, Curtain.

Cutters—

Meat—

Dixon's, # doz.	
Nos.	
Woodruff's, # doz.	
Nos.	
Hale's Pattern, # doz.	
Nos.	
American.	
Nos.	
Enterprise.	
Nos.	
Each.	
Great American Meat Cutter.	
Nos.	
Each.	
Miles' Challenge, # doz.	
Nos.	
Home No. 1, # doz.	
Draw Cut, each.	
Nos.	
Beef Shavers (Enterprise).	
Little Giant (P. S. & W. Co.).	
Chadborn's Smoked Beef Cutter, # doz.	

Tobacco

Champion.	
All Iron.	
Nashua Lock Co.'s.	
Wilson's.	
Sargent's.	
Acme.	

Washer—

Smith's Pat.	
Johnson's.	
Penny's.	
Appleton's.	
Bonney's.	
Cincinnati.	

Dampers, &c.—

Dampers, Buffalo.	
Buffalo Damper Clips.	
Crown Damper.	
Excelsior.	

Diggers, Post Hole, &c.—

Samson.	
Fletcher Post Hole Augers.	
20¢ & 20¢ & 10¢	
Eureka Diggers.	
Vaughan's Post Hole Auger.	

Kohler's Little Giant.

Kohler's Hercules.	
Kohler's Invincible.	
Kohler's New Champion.	
Scheidler.	
Cronk's Post Bars.	

Gibbs' Post Hole Digger.

Gibbs' National.	
Gibbs' Columbia.	
Gibbs' Imperial.	
Shimer's Hollow Handle.	

Dividers—See Compasses.**Dog Collars—See Collars, Dog.****Door Springs—**

See Springs, Door.

Drawers.

Money, # doz.

Drawing Knives—

See Knives, Drawing.

Drills and Drill Stocks—

Blacksmiths'.	
Blacksmiths' Self-Feeding, each.	
Erast, P. S. & W.	
Breast, Wilson's.	
Breast, Millers Falls.	
Breast, Bartholomew's.	
Ratchet, Merrill's.	
Ratchet, Ingersoll's.	
Ratchet, Parker's.	
Ratchet, Whitney's.	
Ratchet, Weston's.	
Ratchet, Moore's Triple Action.	
Ratchet, Curtis & Curtis.	
Whitney's Hand Drill, Plain.	
Adjustable.	
Wilson's Drill Stocks.	
Automatic Boring Tools.	
Chicopee Automatic Drill.	

Twist Drills—

Cleveland.	
Diamond, W. & B.	
Graham's Pat. Groove Shank.	
Morse.	
New Process.	
Standard.	
Syracuse (Meta list).	

Drill Bits or Bit Stock

Drills—See Augers and Bits.

Drill Chucks—See Chucks.**Dripping Pans—**

See Pans, Dripping.

Drivers, Screw—

Douglas Mfg. Co.	
Disston's.	
Buck Bros.	
Stanley R. & L. Co.'s	
No. 64, Varnished Handles.	
No. 86.	
Sargent & Co.'s	
No. 1, Forged Blade.	
Nos. 20, 40 and 60.	
P. S. & W.	
Knapp & Cowies	
No. 1.	
No. 2.	
No. 3.	
Nos. 4 and 00, Acme and Ideal.	
Stearns'.	
Gay & Parsons.	
Champion.	
Clark's Pat.	
Crawford's Adjustable.	
Ellis's Socket and Ratchet.	
Allard's.	
Koll's Common Sense.	
Syracuse Screw-Drive Bits.	
Screw Driver Bits, Parr's.	
May's Hot Hole Sets.	
P. D. & Co.'s All Steel.	
Cincinnati.	
Brace Screw Drivers.	
Buck Bros' Screw Driver Bits.	
Goodell's Automatic.	
Mayhew's Black Handle.	
Blitz.	
C. T. Williamson Wire Novelty Co.	

Egg Beaters—See Beaters, Egg**Egg Poachers—**

See Poachers, Egg.

Electric Bell Sets—

See Bells, Electric.

Emery—No. 4 to No. 54 to Flour, CF.

Kegs, # doz.	
4 kegs, # doz.	
4 kegs, # doz.	
10-b cans, 10	
10-b cans, 10	
than 10.	

Enameled and Tinned

Ware—See Ware, Hollow.

Escutcheon Pins—

See Pins, Escutcheon.

Escutcheons—

Door Lock.—Same dis. as Door Locks.

Brass Thread.

Wood.

Expanded Metal—

Lathing.	
Fencing, Painted Sheets.	
Netting, Painted Sheets.	
Door Mats, Galvalad.	
Window Guards, Paneled.	
Tree Guards, Paneled.	

Extractors, Lemon Juice

—See Squeezers, Lemon.

Fasteners, Blind—

Mackrell's.	
Van Sand's Screw Pat.	
Van Sand's Old Pat.	
Austin & Eddy, No. 2008.	
Security Gravity.	
Zimmerman's.	

Faucets—

Fenn's.	
Bohren's Pat. Rubber Ball.	
Fenn's Cork Stops.	
Star.	
Frary's Pat. Petroleum.	
F. & L. B. Co.	

Fast Lock, Open and Shut Key.

Star Metal Plug, new list.	
Lockport, Metal Plug, reduced list.	
Metallic Key, Leather Lined.	
Cork Lined.	
Burnside's Red Cedar.	
Burnside's Red Cedar, bbl. lots.	
John's.	

Peerless Best Block Tin Key.

IXL 1st quality, Cork Lined.	
Diamond Lock.	
Perfection, Fla. Red Cedar (in boxes).	
Boss Metallic Key.	
Reliable Cork Lined.	
O. K. Western Pattern Cork Lined.	
Star Metal Plug (in bbls.).	
Western Pattern Metal Key.	
No Brand Metal Key.	

Self Measuring

Enterprise, # doz.	
Lane's # doz.	
Victor.	

Felloe Plates—

See Plates, Felloe.

Fibre Ware—See Ware Fibre.**Fifth Wheels—**

Derby and Cincinnati.	
Brewster.	

Files—Domestic—

Nicholson Files, Rasps, &c.	
Nicholson (X.F.) Files.	
Nicholson's Royal Files (Seconds).	
(extra prices on certain sizes).	
American.	
G. & H. Barnett (Black Diamond).	
Aracade.	
Eagle.	
Other makers, best brand.	
Fair brands.	
Second quality.	
Heller's Horse Rasps.	
McCauley's Horse Rasps.	
Clifton Horse Rasps, Hard Cut.	
Aracade Horse Rasps.	

Imported—

Butcher.	
Stubs.	

Fixtures, Grindstone—

Sargent's Patent.	
Reading Hardware Co.	
P. S. & W. Co.	

Fluting Machines—

See Machines, Fluting.

Fluting Scissors—

See Scissors, Fluting.

Fodder Squeezers—

See Squeezers, Fodder.

Forks—

Hay, Manure, &c. Asso. List.	
Hay, Manure, &c., Phila. List.	
Plated, see Spoons.	

Frames—

Saw—

White Vermont.	
Red, Polished and Varnished.	

Screen, Window and Door—

Porter's Pat. Window and Door Frame.	
Warner's Screen Corner Irons.	
Stearns Frames and Corners.	
Cortland.	

Freezers, Ice Cream—

White Mountain.	
Granite State.	
Artic.	
American.	
Buffalo Champion.	
Shepard's Lightning.	
Blizzard.	
Double Action Crown.	
Crown.	
Star.	
Peerless.	
Giant.	
Zero.	
Boss and Pat.	
Keystone, P. D. & Co., each.	
Standard.	
Standard Double Action.	
Expert.	
Model.	
Confectioners' Machine.	

Fruit and Jelly Presses—

See Presses, Fruit and Jelly.

Fry Pans—See Pans, Fry.**Funnels—**

Gersdorff's Perfection, Standard and	
Globe; Tin, 1 gro., 10¢; 2 to 5 gro.	
20¢; 5 to 10 gro.	
Copper, 1 to 12 doz., 15¢; 5 to 12	
doz., 30¢; over 12 doz.	

Furnaces, Soldering—

Burgess No. 3 Gem tin reservoir.	
Burgess No. 3 Gem, Copper reservoir.	

Fuse—Dis. 12¢ & 15¢.

Double Taped Fuse, for very wet gr..	4.8
Triple Taped Fuse, for very wet gr..	5.6
Small Gutta Percha Fuse, for water.	7.5
Large Gutta Percha Fuse, for water.	12.0

Gutta Percha

Halters—

Cover's, Rope, Jute.....60&10&10&25
 Cover's Rope, 7/16 in. Hemp.....70&25
 Cover's Rope, 1/2 in. Hemp.....50&25
 Cover's Adj. Rope Halters.....40&25
 Cover's Hemp Horse and Cattle Tie.....50&10&25
 Cover's Jute Horse Ties.....70&25
 Cover's Jute Cattle Ties.....70&10&25
 Cover's Adj. Web Halters.....35&25
 Cover's Saddlery Works Halters.....33&25
 Cover's Saddlery Works Horse and Cattle Ties.....33&25

Hammers—

Handled Hammers—
 Maydole's, list Dec. 1, '85.....25&10&35
 Buffalo Hammer Co.....50&10
 Humason & Beckley.....50&10
 Atha Tool Co.....40&10
 Verree.....40&10
 C. Hammond & Son.....40&10
 Fayette R. Plumb.....40&10
 Artisans' Choice, A. E. Nail.....40&10
 Regular Y. & P. A. E. Nail.....50
 Horseshoe Turning Hammers.....50
 Other Hammers.....50&10
 Cheney's Claw.....40&10
 Cheney's Machinist's & Riveter.....40&10
 Magnetic Tack, Nos. 1, 2, 3, \$1.25, 1.50 & 1.75.....30&10
 Nelson Tool Works.....40&10
 Warner & Nobles, new list.....25&10
 Peck, Stow & Wilcox.....40&10
 Sargent's.....40&10

Heavy Hammers and Sledges—

3 lb and under.....\$40¢
 5 lb.....\$35¢
 8 lb.....\$30¢
 Over 8 lb.....\$25¢
 Wilkinson's Smiths.....10¢@11¢

Handcuffs and Leg Irons—

—See Police Goods.

Handles—

Cross-Cut Saw Handles—
 Atkins', new list.....40¢
 Champion.....15¢
 Ely's Perfection.....\$ doz., \$3.00

Iron, Wrought or Cast—

Door or Thumb.
 Nos. 0 1 2 3 4
 Per doz.....\$0.90 1.00 1.08 1.35 1.50
 Roggin's Latches.....\$ doz 30¢@35¢
 Bronze Iron Drop Latches.....\$ doz 70¢ net
 Jap'd Store Door Handles—Nuts, \$1.62
 Plate, \$1.10; no plate, \$0.88.....net
 Barn Door, \$ doz \$1.40.....net
 Chest and Lifting.....70¢@70&10

Wood—

Saw and Plane.....40&10@50
 Hammer, Hatchet, Axe, &c.....40&10@50
 Bradawl.....\$ gr 2.00
 Hickory Firmer Chisel, ass'd.....\$ gr 3.00
 Hickory Firmer Chisel, large.....\$ gr 5.00
 Apple Firmer Chisel, ass'd.....\$ gr 5.00
 Apple Firmer Chisel, large.....\$ gr 5.00
 Socket Firmer Chisel, ass'd.....\$ gr 3.00
 Socket Framing Chisel, ass'd.....\$ gr 3.00
 J. B. Smith & Co.'s Pat File.....50¢
 File, assorted.....\$ gr 2.75
 Auger, assorted.....\$ gr 5.00
 Pat. Auger, large.....\$ gr 7.00
 Pat. Auger, 1/2 in.....30&10
 Pat. Auger, Douglass.....\$ set \$1.25
 Pat. Auger, Swan's.....\$ set \$1.00
 Hoe, Rake, Shovel, &c.....60&10@25

Hangers—

Barn Door, old patterns.....70¢@70&10
 Barn Door, New England.....70¢@70&10
 Samson Steel Anti-Friction.....55¢
 Orleans Steel.....55¢
 Hamilton Wrought Steel Track.....55¢
 U. S. Wood Track.....55¢
 Champion.....60&10
 Climax Anti-Friction.....60&10
 Climax Anti-Friction for Wood Track.....55¢
 Zenith for Wood Track.....55¢
 Reed's Steel Arm.....50¢
 Challenge, Barn Door.....50¢
 Sterling.....50&10
 Victor, No. 1, \$15.00; No. 2, \$16.50; No. 3, \$18.00.....50&10
 Cheritree.....50&10
 Kidder's.....40&10@50
 Boss.....60&10@50
 Best Anti-Friction.....60&10@50
 Duplex (Wood Track).....60&10@50
 Terry's Modern Anti-Friction (all steel).....50&10@50
 Terry's Ideal Anti-Friction (all steel).....50&10@50
 Terry's Solid Anti-Friction (all steel).....50&10@50
 Terry's Shield Anti-Friction (all steel).....50&10@50
 Terry's Wrought Single Strap.....50&10@50
 Cronk's Patent, Steel Covered.....50&10
 Wood Track Iron Clad, \$ ft 10¢.....60
 Carrier Steel Anti-Friction.....50&10
 Architect, \$ set \$0.00.....20¢
 Eclipse.....20¢
 Felix, \$ set \$4.50.....20¢
 Richards.....30¢@30&10
 Lane's New Standard.....50¢@50&10
 Lane's Standard.....50¢@50&10
 Lane's Parlor.....40¢
 Ball Bearing Door Hanger.....20¢@20&10
 Warner's Pat.....20¢@20&10
 Stearns' Anti-Friction.....20¢@20&10
 Stearns' Challenge.....25¢@25&10
 Faultless.....40¢@40&10
 American, per set \$6.00.....20¢@20&10
 Paragon, Nos. 1, 2 and 3.....40¢@40&10
 Cincinnati.....25¢@25&10
 Paragon, Nos. 5, 6, 7 and 8.....25¢@25&10
 Crescent.....60¢@60&10
 Nickel, Steel, Nos. 0, \$25; 1, \$20; 2, \$15.....40&10
 Soranton Anti-Friction Single Strap.....33¢@33&10
 Wild West, 4 in. Wheel, \$15.00; 5 in. Wheel, \$21.00.....45¢
 Star.....40&10@40&10
 May.....40&10@40&10
 Barry, \$6.00.....40&10
 Interstate.....50&10@60
 Macle.....45¢
 Pendulum, Pavson's.....40¢@40&10
 Moody.....45¢

Hatchets—

American Axe and Tool Co.....40 & 10
 Buffalo Hammer Co.....50 & 10
 Hunt's.....50 & 10
 Hurd's.....50 & 10
 Mann's.....50 & 10
 Peck's.....50 & 10
 Underhill's.....50 & 10
 Fayette R. Plumb.....40 & 10
 C. Hammond & Son.....40 & 10
 Kelly's.....40 & 10
 Sargent's & Co.....40 & 10
 S. & W. Co.....40 & 10
 Reading Edge Tool Co.....10¢
 Pen Eyck Edge Tool Co.....10¢
 Collins.....50 & 50
 Schulte, Lohoff & Co.....50 & 50

Hatchets—

American Axe and Tool Co.....40 & 10
 Buffalo Hammer Co.....50 & 10
 Hunt's.....50 & 10
 Hurd's.....50 & 10
 Mann's.....50 & 10
 Peck's.....50 & 10
 Underhill's.....50 & 10
 Fayette R. Plumb.....40 & 10
 C. Hammond & Son.....40 & 10
 Kelly's.....40 & 10
 Sargent's & Co.....40 & 10
 S. & W. Co.....40 & 10
 Reading Edge Tool Co.....10¢
 Pen Eyck Edge Tool Co.....10¢
 Collins.....50 & 50
 Schulte, Lohoff & Co.....50 & 50

Hay and Straw Knives—

See Knives.

Hinges—**Blind Hinges—**

Parker.....75¢@25¢
 Huffer.....50¢
 Clark's, Nos. 1, 3, 5, 40 and 50.....80¢@80&5¢
 Clark's Mortise Gravity.....50¢
 Sargent's, Nos. 1, 3, 5, 11, 12, 15, 75&10¢
 Shepard's.....75¢@10¢
 Noiseless.....75¢@10¢
 Niagara.....80¢
 Buffalo.....80¢
 Clark's Genuine Pattern.....80¢
 O. S. Lull & Porter.....75¢@10¢
 Queen City Reversible.....70¢@10¢
 Clark's, Lull & Porter, Nos. 0, 1, 1 1/2, 2, 2 1/2, 3.....75¢@10¢
 North's Automatic Blind Fixtures, No. 2, for Wood, \$9.00; No. 3, for Brick.....\$11.50

Gate Hinges—

Western.....\$ doz \$4.20, 60¢@60&10¢
 N. E.....\$ doz \$7.80, 60¢@60&10¢
 N. E. Reversible.....\$ doz \$5.80, 60¢@60&10¢
 Clark's, Nos. 1, 2, 3.....60¢@10¢
 N. Y. State.....\$ doz \$4.90, 60¢@60&10¢
 Automatic.....\$ doz \$12.50, 50¢
 Shepard's.....60¢@10¢

Spring Hinges—

Geer's Spring and Blank Butts.....40¢
 Union Spring Hinge Co.'s list.....20¢
 March, 1888.....20¢
 Barker's Double Acting.....25¢
 Union Mfg. Co.....25¢
 Bommer's.....30¢
 Buckman's.....15¢@20¢
 Chicago.....15¢
 Cardley's Patent Cheeking.....30¢
 Acme.....25¢@10¢
 U. S.....25¢@10¢
 Empire and Crown.....20¢
 Hero and Monarch.....55¢
 American, Gem and Star.....20¢
 Card.....60¢
 Royal.....60¢
 Reliable.....60¢
 Champion.....60¢
 No. 10 Matchless.....60¢
 No. 25 Unbreakable.....60¢
 J. G. C. Covered, \$ gro, \$30.....50¢
 Samson.....\$ doz 60¢
 Wiles, No. 1, \$ gro, \$10; No. 2.....\$13
 Devore, No. 1.....\$ gro, \$13.00
 Rex.....\$ gro, \$13.00
 Freeport.....\$ gro, \$12.00

Wrought Iron Hinges—

List February 14, 1891.
 Strap and T.....50&10@50&10&5¢
 Corrugated Strap and T.....50&10@50&10&5¢
 Screw Hook and Eye.....\$ 6 to 12 in., \$ m. 4¢
 Strap.....\$ 14 to 20 in., \$ m. 3¢
 \$ 22 to 36 in., \$ m. 3¢
 Screw Hook and Eye.....\$ 1/2 in., \$ m. 7¢
 \$ 3/4 in., \$ m. 7¢
 \$ 1 in., \$ m. 4¢
 Rolled Blind Hinges, Nos. 32 and 34.....50&10
 Rolled Blind Hinges, Nos. 232 and 242.....50&10
 Rolled Plate.....70&10
 Rolled Raised.....70&10
 Plate Hinges (8, 10 & 12 in., \$ m. 5¢
 "Providence" over 12 in., \$ m. 4¢

Hoes—**Eye—**

D. & H. Scovill.....20¢
 Lane's Crescent, Planters' Pattern.....45¢
 Lane's Razor Blade, Scovill Pattern.....30¢
 Maynard, S. & O. Pat.....45¢
 Sandusky Tool Co., S. & O. Pat.....70¢@70&10
 Am. Axe and Tool Co., S. & O. Pat.....5¢
 Chattanooga Tool Co., S. & O. Pat.....60¢
 Grub.....60&10

Handled—

Garden, Mortar, &c.....70¢@70&5¢
 Planter's Cotton, &c.....70¢@70&5¢
 Warren Hoe.....60¢@60&5¢
 Magic.....\$ doz \$4.00

Hog Rings and Ringers—

See Rings and Ringers.

Hoisting Apparatus—

See Machines, Hoisting.

Hollow-Ware—

See Ware, Hollow.

Holders—**Bag—**

Sprengle's Pat.....\$ doz \$18.....80¢

Bit—

Extension.....\$ doz \$15.00.....40¢@40&10¢
 Barber's, \$ doz \$20.00.....60¢@60&10¢
 Diagonal.....\$ doz \$24.00, 40¢
 Angular.....\$ doz \$24.00, 40¢

File and Tool—

Balz Pat.....\$ doz \$4.00, 25¢
 Nicholson File Holders.....20¢
 Dick's Tool Holder.....20¢

Hooks—**Cast Iron—**

Bird Cage, Sargent's List.....80¢@10&10¢
 Bird Cage, Reading.....80¢@10&10¢
 Clothes Line, Sargent's list.....80¢@10&10¢

Clothes Line, Reading list.

60&10@60&10&10¢
 Ceiling, Sargent's list.....55&10@10¢
 Harness, Reading list.....55&10@10¢
 Coat and Hat, Sargent's list.....55&10@10¢
 Coat and Hat, Reading.....50&10@50¢@10&10¢

Wrought Iron—

Cotton.....\$ doz \$1.25
 Cotton Pat. (N. Y. Mallet and Handle Wks.).....30¢
 Tassel and Picture, T. & S. Mfg. Co.....50¢
 Wrought Staples, Hooks, &c.....See Wrought Goods

Wire—

Wire Coat and Hat, Gem, list April, 1888.....80¢@60&10¢
 Wire Coat and Hat, Miles, list April, 1888.....50¢@50&10¢
 Indestructible Coat and Hat.....45¢@45&5¢
 Wire Coat and Hat, Standard.....60¢@60&10¢
 Handy Hat and Coat.....50¢@10¢
 Steady Ceiling Hooks.....50¢@10¢
 Belt.....80¢@15¢@80&20¢
 Atlas, Coat and Hat.....65¢
 Williamson's Bird Cage Hooks, List April, 1892.....40¢
 Bright Wire Goods—See Wire.

Miscellaneous—

Grass, No. 2, \$2.00; No. 3, \$2.10; No. 4, \$2.25
 Noll's Grass.....\$ doz \$2.25
 Bush.....55¢@60¢
 Whitetree—Patent.....55¢
 Hooks and Eyes—Malleable Iron.....70¢@70&10¢
 Fish Hooks, American.....60¢@10¢
 Bench Hooks—See Bench Stops.

Horse Nails—See Nails, Horse**Horse Shoes—**

See Shoes, Horse.

Hose, Rubber—

Competition.....75¢@75&10&5¢
 Standard.....60¢@10¢@70&10¢
 Extra.....60¢@10¢
 N. Y. B. & P. Co., Para.....25¢
 N. Y. B. & P. Co., Extra.....40¢@40&5¢
 N. Y. B. & P. Co., Dundee.....50¢@10¢@60¢

Huskers—

Blair's Adjustable.....\$ gr \$8.00
 Blair's Adjustable Clipper.....\$ gr 7.00
 Hubbard's Solid Steel.....\$ gr 4.50

Indurated Fiber Ware—

See Ware, Indurated Fiber.

Irons.**Sad—**

From 4 to 10, at factory.....\$ 100
 Self-Heating.....\$23.00@24.40
 Self-Heating Tailors'.....\$ doz \$8.00
 Enterprise Irons, list Jan. 17, 1893.....30¢
 Enterprise Star Irons, list Jan. 17, '93.....30¢
 Crown.....60¢@10¢@60&10&5¢
 Deal Irons, new list.....50¢@10¢@50&10&10¢
 Samson's Troy Pol. Irons.....25¢
 B. B. Sad Irons, \$ m.....3¢@3¢
 Combined Fluter and Sad Iron, \$ doz.....\$15.00
 Fox Reversible Self-Fluter.....\$ doz, \$24.00
 Chinese Laundry (N.E. Butt Co.).....\$ doz, 15¢
 New England.....\$ doz, 15¢
 Mahony's Troy Pol. Irons.....50¢@10¢
 Sensible, list Jan. 91.....50¢@10¢
 Sensible Tailor's Irons.....33¢
 National Self-Heating.....30¢

Soldering—

Soldering Coppers.....\$ m 19¢@21¢
 Cover's Adjustable, list Jan. 1, 1886.....35¢@2¢

Pinking—

Pinking Irons, \$ doz., 55¢@60¢

Jack Screws—See Screws.**Jacks, Wagon—**

Daisy.....33¢
 Victor.....33¢
 Lockport.....40¢

Kettles—

Brass, Spun, Plain, list Jan. 1, '91, 25¢&5¢
 Brass, Spun, Pld. Wm. list Jan. 1, '91, 20¢
 Enameled and Tea—See Ware, Hollow.

Keys—

Lock, Ass'n list Dec. 30, 1886.....50¢@10¢
 Eagle, Cabinet, &c.....60¢
 Hotchkiss' Brass Blanks.....40¢
 Hotchkiss' Copper and Tinned.....40¢
 Ames' Bread Knives.....35¢
 Ratchet Bed Keys.....\$ doz \$4.00, 15¢
 Wollensak Tinned.....50¢@10¢

Knife Sharpeners—

See Sharpeners, Knife.

Knives—**Butcher, Shoe, &c.**

Wilson's Butcher Knives, list Dec 8, 1888.....25¢
 Ames' Butcher Knives.....25¢
 Foster Bros' Butcher, &c.....40¢
 Jordan's A. A. Butcher's, list.....net
 Nichols' Butcher Knives.....40¢@10¢
 W. W. Wilson, Butcher, 6 in., \$2.00; 7 in., \$2.70; 8 in., \$3.80, &c.....20¢@25¢
 Ames' Shoe Knives.....\$ doz \$1.50, 15¢@20¢
 Moran's Shoe and Bread.....20¢@20&10¢
 Hay and Straw—See Hay Knives.
 Table and Pocket—See Cutlery.

Corn—

Bradley's.....10¢
 Wadsworth's.....25¢@25&10¢

Drawing—

Wetherby.....75¢@75&10&5¢
 P. S. & W.....75¢@75&10&5¢
 Mix.....60¢@10¢@60&10&5¢
 New Haven.....60¢@10¢@60&10&5¢
 Merrill.....75¢@75&10&5¢
 Douglass.....15¢@10¢@25¢
 Watrous.....15¢@10¢@25¢

L. & J. J. White.....20¢
 Bradley's.....25¢
 Adjustable Handle.....25¢
 Wilkinson's Folding.....25¢@25&5¢

Hay and Straw—

Lightning from jobbers.....\$8.00@9.00
 Fadsworth.....40¢@70¢@40&10¢
 Carter's Needle.....\$ doz \$11.00@11.50
 Heath's.....\$ doz \$13.00@13.50
 Nolin's Hay.....\$ doz \$7.00@8.00

Mincing—

Am. (2d quality), \$ gr., 1 blade, \$7
 2 blades, \$12; 3 blades, \$18.....net
 Lothrop's.....\$ doz, Single, \$2; Double \$3
 Smith's, \$ doz., Single, \$2; Double \$3
 Knapp & Cowles.....50¢@10¢
 Buffalo Adjustable.....\$ doz \$3.00, 25¢
 Buffalo Double Adjustable.....\$ doz \$3.00

Knobs—

Door, Mineral.....60¢@5¢
 Door, Por. Jap'd.....70¢@75¢
 Door, Por. Nickel.....\$2.00@2.25
 Door, Por. Plated Nickel.....\$2.00@2.25
 Drawer, Porcelain.....60¢@10¢@60&10¢
 Hemacite Door Knobs.....40¢@10¢
 Yale & Towne Wood, list Dec. 1885.....40¢
 Furniture Plain.....75¢ gro inch, 10¢
 Furniture, Wood Screws.....25¢@10¢
 Base, Rubber Tip.....70¢@10¢
 Picture, Judd's.....60¢@10¢
 Picture, Sargent's.....35¢
 Picture, Hemacite.....35¢
 Shutter, Porcelain.....65¢
 Carriage, Jap.....\$ gro 80¢, 60¢@10¢
 Bardsley's Wood Door, Shutter, &c.....15¢

Ladies—

Melting, Sargent's.....60¢@60&5¢
 Melting, Reading.....35¢
 Melting, Monroe's Pat.....\$ doz \$4.00, 40¢
 Melting, P. S. & W.....35¢@10¢
 Melting, Warner's.....80¢

Lanterns—**Tubular—**

Regular, with Guard.....\$ doz \$3.50
 O. K. with Guard.....\$ doz \$3.75
 Side Light, with Guard.....\$ doz \$4.00
 Square Lift, with Guard.....\$ doz \$4.25
 Anti-Friction, with Guard.....\$ doz \$4.50
 Brass Plated, Sq. Lift, Guard.....\$ doz \$5.50
 Cop. Plated, Sq. Lift, Guard.....\$ doz \$5.50

Bull's Eye Police—

3 1/2-inch regular.....\$ doz \$3.60
 3-inch regular.....\$ doz \$3.90
 3-inch flash light.....\$ doz \$4.00
 3-inch flash light.....\$ doz \$4.50

Lawn Mowers—

See Mowers, Lawn.

Leaders, Cattle—

Humason, Beckley & Co.'s.....70¢
 Sargent's.....70¢@10¢@70&10&10¢
 Hotchkiss.....30¢
 Peck, Stow & W. Co.....60¢@10¢

Lemon Squeezers—

See Squeezers, Lemon.

Lifters, Transom—

Wollensak's:
 Class 3 and 4, Bronzed Iron.....50¢
 Class 3 and 4, Bronze Metal.....25¢
 Class 3 and 4, Brass.....35¢
 Skylight Lifters.....35¢
 Crown, Eagle and Shield.....50¢
 Reither's, list Feb. 20, 1891.....50¢@10¢@50&10&2¢
 Bronzed Iron Rods.....50¢@10¢@50&10&2¢
 Brass, Real Bronze or Nickel Plate.....30¢
 Excelsior.....50¢@10¢@50&10&2¢
 Shaw's.....50¢@10¢
 Payson's:
 Universal.....60¢
 Solid Grip.....60¢@10¢@60&10&10¢
 Imperial.....50¢@10¢

Lines—

Cotton and Linen Fish, Draper's.....50¢
 Draper's and Tate's Chalk.....60¢
 Draper's Mason's Linen, 84 ft., No. 1, \$1.25; No. 2, \$1.75; No. 3, \$2.25, &c.....\$1
 \$2.75; No. 5, \$3.25.....55¢
 Cotton Chalk.....55¢
 Samson Cotton, No. 4, \$2; No. 4 1/2, \$2.50; No. 5, \$3.00.....10¢
 Silver Lake, Braided, No. 0, \$6.00; No. 1, \$6.50; No. 2, \$7.00; No. 3, \$7.50.....25¢
 Mason's Linen, No. 3, \$1.50; No. 4, \$2.00; No. 4 1/2, \$2.50.....45¢
 Mason's Colored Cotton.....45¢
 Wire Clothes, Nos. 18 19 20 100 ft.....\$3.50 \$3.00 \$2.50
 Ventilator Cord, Samson Braided.....\$ doz \$7.50, 20¢
 White or Drab Cotton.....\$ doz \$7.50, 20¢
 Ossawan Mills, Chalk, Twisted, 60'; Chalk, Soft Braided, 60' Chalk, Braided, 25¢.

Links, Open—

Brittan, Graham & Mathes, list Jan. 1890.
 Perkins' Burglar Proof.....60&10&10%
 Plate.....33&25%
 Barnes Mfg. Co.....40&40&10%
 Yale.....net prices
 Delta Flat Key.....30&10%
 L. & C. Round Key Latches.....30&10%
 L. & C. Flat Key Latches.....33&10%
 Bomer's Night Latches.....15%
 Brooklyn Latches.....50&10%
 Shephardson or U. S.....35%
 Seed's N. Y. Hasp Lock.....25%
 Warner's Burglar Proof, # doz, \$3.00, 50%

Padlocks—

List June 10, 1891.....50&2%
 Norwich Lock Mfg. Co., old list.....50&2%
 Yale Lock Mfg. Co.'s.....net prices
 Eagle.....40%
 Eureka, Eagle Lock Co.....40&2%
 Romer's Nos. 0 to 91.....30%
 Romer's Scandinavian, &c., Nos. 100 to 505.....15%
 A. E. Deltz.....40%
 Champion Padlocks.....40%
 Hotchkiss.....30%
 Star.....60%
 Horseshoe.....# doz \$9, 40&40&10%
 Barnes Mfg. Co.....40&40&10%
 Nock's.....30%
 Brown's Pat.....50%
 Scandinavian.....60&40%
 E. F. Fram's Keystone Scandinavian, Nos. 119, 120, 130 and 140.....90&10%
 Other Nos.....65%
 Ames Sword Co. up to No. 150.....40%
 Ames Sword Co. above No. 150.....50%
 Slaymaker, Harry & Co.....35&5%
 No. 1010 line.....45&10%
 No. 41 line.....50&5%
 No. 61 line.....50&5%
 No. 21 line.....75%

Sash, &c.—

Clark's No. 1, 110; No. 2, \$3 gr.....33&4%
 Ferguson's.....33&4%
 Victor.....60&10&2%
 Walker's.....25&33%
 Attwell Mfg. Co.....60%
 Reading.....60%
 Hammond's Window Springs.....40%
 Common Sense, Jap'd, Cop'd and Br'ed.....# gr \$4.00
 Common Sense, Nickel Plated.....# gr \$10.00
 Universal.....30%
 Kempshall's Gravity.....60%
 Kempshall's Model.....60&60&10%
 Corbin's Daisy, list Feb. 15, 1888.....70%
 Payson's Perfect.....60&10&10%
 Huginlin's Sash Balances.....25&25&10%
 Huginlin's New Sash Locks.....25&25&10%
 Stoddard's "Fractical".....60%
 Ives Patent.....60&10&5%
 Fish (Liesche's pat.), No. 100, # gr, \$8; No. 105, # gr, \$10.....50%
 Davis, Bronze, Barnes Mfg. Co.....70%
 Champion Safety, list January, 1890, 40%
 Security.....70&5%
 Giant, list Jan., 1892.....70&5%
 Volcott's.....60&10&5%
 Monarch.....50%

Lumber Tools—

See Tools, Lumber.

Lustro—

Four-ounce bottles.....# doz, \$1.75; # gross.....\$17.00

Machines.**Boring—**

Without Augers. Upright. Angular.
 Douglas.....\$5.50 \$8.75.....50%
 Snell's, Rice's Patm.....5.50 6.75 40&10&10%
 Jennings.....5.50 6.75 45&10%
 Other Machines.....2.55 2.75
 Phillips' Patent with Augur.....7.00 7.50
 Miller's Falls.....7.50.....25%

Fluting—

Knox, 4 1/2-inch Rolls.....\$3.25 each } 35%
 Knox, 6-inch Rolls.....\$3.60 each }
 Eagle, 3 1/2-inch Rolls, \$2.15.....35%
 Eagle, 5 1/2-inch Rolls, \$2.85.....35%
 Crown, 4 1/2 in., \$3.50; 6 in., \$4.00; 8 in., \$5.00 each.....35%
 Crown Jewel, 6 in.....\$3.50 each, 35%
 American, 6 in., \$3.00; 6 in., \$3.40; 7 in., \$4.50 each.....35%
 Domestic Fluter.....each, \$1.50
 Geneva Hand Fluter, White Metal, # doz \$12, 25%
 Crown Hand Fluter, Nos. 1, \$15.00; 2, \$12.50; 3, \$10.00.....30%
 Shephard Hand Fluter, No. 85, per doz \$15.30.....40%
 Shephard Hand Fluter, No. 110, # doz \$11.00.....40%
 Shephard Hand Fluter No. 95, # doz \$8.00.....40%
 Clark's Hand Fluter, # doz \$15.00.....35%
 Combined Fluter and Sad Iron.....# doz \$15.00.....30%
 Buffalo, # doz \$10.00.....10%

Holisting—

Moore's Hand Holist, with Lock Brake, 20%
 Moore's Differential Pulley Block.....40%
 Energy's Mfg. Co.'s.....30%
 Sure Grip Steel Table Blocks.....25%

Washing—

Anthony Wayne, # doz, No. 1, \$51; No. 2, \$45; No. 3, \$42.
 Western Star # doz, No. 2, \$45; No. 2 #48.
 Weisell.....# doz \$54.00
 Fair and Square.....# doz \$42.00

Mallets—

Hickory.....20&10&20&10&10%
 Lignumvitum.....20&10&20&10&10%
 B. & L. Block Co., Hickory & L. V.....30&30&10%

Mattocks—Regular list.

60&10&60&10&5%

Measures—

Standard Fireware, No. 1, peck # dozen, \$4; 1/2 peck, \$3.50.

Meat Cutters—

See Cutters, Meat.

Menders, Harness—

Per doz.....\$2.00

Mills—**Coffee—**

Box and Slide, List Jan. 1, 1888, 60&10%
 Net prices are often made which are lower than above discount.
 American, Enterprise Mfg. Co., list Jan. 17, 1893.....20%
 The Swift, Lane Bros.....30%

Mincing Knives—

See Knives, Mincing.

Molasses Gates—

See Gates, Molasses.

Money Drawers—

See Drawers, Money.

Mowers, Lawn—

Philadelphia.....60&10%
 Pennsylvania and Continental.....60%
 New Model and Excelsior.....60&60&10%
 Other Machines.....60&10&10&75%

Muzzles—

Safety.....# doz, \$3.00, 25%

Nails—

Cut and Wire. See Trade Report.
 Wire Nails, Papered.
 Association List, May 1, '92, 80&10&10&5%
 Tack Mfrs' list.....70&5%
 Hungarian, Finishing, &c. See Tacks.

Horse—

Nos. 6 7 8 9 10
 American.....88 89 89 89 89 .net
 Ausable.....28 26 25 24 23
 Clinton, Flin.....19 17 16 15 14 30&10%
 Essex.....28 26 25 24 23
 Lyra.....19 17 16 15 14 40&10%
 Snowden.....19 17 16 15 14 40&10%
 Vulcan.....23 21 20 19 18 25%
 Northwest'n.....25 23 22 21 20 25&25&5%
 A. C.....25 23 22 21 20 25&25&5%
 C. B. K.....25 23 22 21 20 25&25&5%
 Maud S.....25 23 22 21 20 40&10&5%
 Champlain.....28 26 25 24 23 40&10&5%
 Saranac.....23 21 20 19 18 40&10%
 Champion.....25 23 22 21 20 40&10%
 Capewell.....19 17 16 15 14 10&10%
 Anchor.....23 21 20 19 18 35%
 Western.....23 21 20 19 18 35%
 Empire Bronzed.....13 12 11 10 9 10&10%
 Picture—
 Brass Head, Sargent's list.....60&60&10%
 Brass Head, Combination list.....50&10%
 Porcelain Head, Sargent's list.....50&10%
 Porcelain Head, Combination list.....40&10%
 Niles' Patent.....40%
 Nail Pullers—See Pullers, Nail.
 Nail Sets—See Sets, Nail.
 Nut Crackers—
 See Crackers, Nut.
 Nuts—List Dec. 18, 1889.
 Square. Hex.
 Hot Pressed.....5.80 6.50 off list
 Cold Punched.....5.00 6.10 off list
 In packages of 100 lb, add 1-10¢ # net; in packages less than 100 lb, add 1/2¢ # net.

Oakum—

Best or Government.....# d 6 1/2 7 1/2
 U. S. Navy.....# d 5 1/2 6 1/2
 Navy.....# d 5 1/2 6 1/2

Oilers—

Zinc and Tin.....65&10&70&5%
 Brass and Copper.....50&10&50&10&5%
 Malleable, Hammers' Improved, No. 1, \$3.60; No. 2, \$4.00; No. 3, \$4.40.....10&10&5%
 Malleable, Hammers' Old Pattern, same list.....45%
 Prior's Pat. or "Paragon" Zinc.....60&10&10%
 Prior's Pat. or "Paragon" Brass.....50%
 Olmstead's Tin and Zinc.....50%
 Olmstead's Brass and Copper.....50%
 Broughton's Zinc.....50%
 Broughton's Brass.....50%
 Gem, P. D. & Co.....# gro, \$2
 Steel, Draper & Williams.....# doz, \$6

Openers, Can—

Messenger's Comet.....# doz \$3.00, 25%
 American.....# gross \$3.75 40&10%
 Duplex.....# doz \$3.75, 25%
 Lyman's.....# doz \$3.75, 25%
 No. 4, French.....# doz \$2.25, 55&60%
 No. 5, Iron Handle.....# gr \$8.00, 45&50%
 Eureka.....# doz \$2.50, 10%
 Sardine Scissors.....# doz \$2.75 30%
 Star.....# doz \$2.75 30%
 Sprague, No. 1, \$2.00; 2, \$2.25; 3, \$2.50.....60%
 Excelsior, No. 1 \$2.50; No. 2, \$1.50.....40%
 World's Best, # gross, No. 1, \$12.00; No. 2, \$24.00; No. 3, \$36.00.....50&10%
 Universal, # doz \$3.00.....55&5%
 Domestic.....# doz \$2.00.....50%
 Champion, # doz \$2.00.....50%

Packing, Steam—**Rubber—**

Standard.....70&70&10%
 Extra.....# doz \$3.00 60&60&5%
 N. Y. B. & Co., Standard.....50%
 N. Y. B. & P. Co., Empire.....60%
 N. Y. B. & P. Co., Salamander.....25%
 Jenkins' Standard, # d 80¢.....25&25&5%

Miscellaneous—

American Packing.....10¢ 11¢ # d
 Russia Packing.....13¢ 14¢ # d
 Italian Packing.....14¢ 15¢ # d
 Cotton Packing.....15¢ 16¢ # d
 Jute.....17¢ 18¢ # d

Pails—**Galvanized—**

Quarts 10 12 14
 Hill's Light Weight, # doz, \$2.75 3.00 3.25
 Hill's Heavy Weight, # dz, 3.00 3.25 3.75
 Helwig's.....2.50 2.75 3.00
 Sidney Shepard & Co.....2.50 2.75 3.00
 Iron Clad.....2.75 3.25 3.50
 Fire Buckets.....2.75 3.25 3.50
 Buckets—See Well Buckets.

Indurated Fiber Ware—25¢

Star Pails, 12 qt.....# doz \$4.20
 Stable and Milk, 14 qt.....# doz \$6.00
 Fire Pails, deep.....# doz \$5.40
 Fire Pails, round bottom.....# doz \$7.80

Standard Fiber Ware—

Water Pails, 12 qt., # doz, \$4.00 Plain. Dec'd \$4.50
 Dairy Pails, 14 qt., # doz, 4.50 5.00
 Fire Pails, No. 1, 12 qt., # doz, 4.50
 Fire Pails, No. 2, 14 qt., # doz, 5.00 6.50
 Sugar Pails.....5.00
 Horse Pails.....4.00
 Buggy Pails.....4.00
 Slop Jars (bal. trap).....8.00 9.00
 Chamber Pails, 14 qt.....6.50 7.50

Pans—**Dripping—**

Small sizes.....# d 6 1/2
 Large sizes.....# d 5 1/2
 Silver & Co. (Covered).....40%

Fry—

Standard List:
 No.....0 1 2 3 4 5
 # doz, \$3.00 \$3.75 \$4.25 \$4.75 \$5.25
 No.....5 6 7 8 9
 # doz.....\$6.00 \$7.00 \$8.00 \$9.00
 Polished, regular goods.....75¢ 75¢ 10%
 Acme Fry Pans.....60%

Dust—

Steel Edge, No. 1.....# doz \$1.75

Paper and Cloth—

Sand and Emery—
 List April 19, 1888.....50&10&50&10&5%
 Sibley's Emery and Crocus Cloth.....30%

Parers—**Apple—**

Advance.....# doz \$4.75
 Baldwin.....# doz 5.25
 Bonanza.....each 5.00
 Daisy.....# doz 4.00
 Dandy.....each 7.50
 Eclipse.....# doz 4.25
 Europa, 1888.....each 16.00
 Family Bay State.....# doz 12.00
 Favorite.....# doz 5.00
 Gold Medal.....# doz 4.00
 Ideal.....# doz 4.00
 Improved Bay State.....# doz 27.00 30.00
 Little Star.....# doz 4.50
 Monarch.....# doz 13.50
 New Lightning.....# doz 5.50
 Orville.....# doz 4.00
 Perfection.....# doz 4.00
 Pomona.....# doz 4.00
 Rocking Table.....# doz 6.00
 Turn Table.....# doz 4.50
 Victor.....# doz 13.50
 Waverly.....# doz 4.00
 White Mountain.....# doz 4.00
 72.....# doz 4.25
 78.....# doz 7.00

Potato—

White Mountain.....# doz \$4.50
 Antrim Combination.....# doz \$5.50
 Hoosier.....# doz \$13.50
 Saratoga.....# doz \$5.50

Pencils—

Faber's Carpenters'.....high list 50¢
 Faber's Round Gilt.....# gro \$5.25
 Dixon's Lead.....# gro \$4.50
 Dixon's Lumber.....# gro \$6.75
 Dixon's Carpenters'.....10%

Picks—

Railroad or Adze Eye, 5 to 6, \$12.00; 6 to 7, \$13.00.....60&10&60&10&5%
 Picture Nails—
 See Nails, Picture.

Pinking Irons—

See Irons, Pinking.

Pins—**Bow—**

Humason, Beckley & Co.'s.....60&10%
 Sargent & Co.'s, \$17 and \$18.....60&10%
 Peck, Stow & W. Co.....50&10&50&10&5%

Curtain—

Silvered Glass.....net
 White Enamel.....net

Escutcheon—

Iron, list Nov. 11, 1885.....50&10&50&10&5%
 Brass.....60&60&5%

Pipe, Wrought Iron—

List October 12, 1892.
 1 1/2 and under, Plain.....60&60&5%
 1 1/2 and under, Galv.....52% 62% 5%
 1 1/2 and over, Plain.....70% 0&5%
 1 1/2 and over, Galv.....60% 60&5%
 Boiler Tubes, list Oct. 24, 1892.....65%
 Casing, list Nov. 18, 1892.....52% 5%
 Inserted Joints Casing, list Nov. 18, 1892.....27% 5%
 Steel Boiler Tubes.....27% 5%
 Cold Drawn Seamless Steel Tubing.....50%

Planes and Plane Irons—**Wood Planes—**

Molding.....40&2%
 Bench, First quality.....45&2%
 Bench, Second quality.....50&2%
 Bailey's (Stanley R. & L. Co.).....50&10%

Iron Planes—

Bailey's (Stanley R. & L. Co.).....50&10%
 Miscellaneous Planes (Stanley R. & L. Co.).....25&10%
 Steers' Iron Planes.....40&10%
 Meriden Mal. Iron Co.'s.....40&10%
 Davis' Iron Planes.....40&10%
 Birmingham Plane Co.....50&10%
 Gage Tool Co.'s Self-Setting.....20&10%
 Chaplin's Iron Planes.....40&10%
 Sargent's.....60%
 Standard Tool Co.....50&50&5%

Plane Irons—

Butcher's.....\$5.00 to \$5.25 to \$8
 Buck Bros.....30%
 Auburn Thistle.....30%
 Ohio.....30&10%
 Sandusky.....25%
 L. & I. J. White.....50&10%
 Stanley R. & L. Co.....50&10%

Plates—

Felloe.....# d 6¢ 6 1/2¢

Pliers and Nippers—

Button's Patent.....60%
 Hall's No. 2, 5 in., \$13.50; No. 4, 7 in., \$21.00 # doz.....40%
 Humason & Beckley Mfg. Co.....50&50&10%
 Lindsay's Giant.....33%
 Gas Pliers.....60%
 Gas Pliers, Custar's Nickel Plated.....60&5%
 Eureka Pliers and Nippers.....40%
 Russell's Parallel.....25%
 P. S. & W. Cast Steel.....50%
 P. S. & W. Tinner's Cutting Nippers, add 8¢.....10%
 Carew's Pat. Wire Cutters.....20%
 Morrill's Parallel, # doz, \$12.00.....30&5%
 Cronk's 8 in., \$15.00; 10 in., \$21.00.....50&50&5%
 Cronk's Button Pattern.....50&10&60%
 Cronk's Carrier Pliers.....60&60&5%

Plumbs and Levels—

Regular List.....75&10&75&10&5%
 Stanley's Duplex.....20&10%
 Stanley's Handy.....20&10%
 Diston's.....70&10%
 Pocket Levels.....70&10%
 Davis Iron Levels.....30%
 Davis' Inclinoimeters.....10&10%

Poachers, Egg—

Buffalo Steam Egg Poachers, # doz, No. 1, \$6.00; No. 2, \$9.00.....25%
 Silver & Co., 6-Ring, # doz, \$4.00; 3-Ring.....\$2.90

Pokes, Animal—

Bishop's I. X. L.....# doz \$3.00
 Bishop's O. K.....# doz \$3.25
 Bishop's Pioneer.....# doz \$3.75
 Bishop's American.....# doz \$2.75
 Eagle, Double Stale.....# doz \$5.75
 Eagle, Single Stale.....# doz \$3.75
 Buckeye, Single Stale.....# doz \$2.75
 Holding.....# doz \$6.00
 Metallic Horse Poke.....# doz, \$6.00

Police Goods—

R. I. Tool Co., Handcuffs, \$15.00 # doz 10%
 R. I. Tool Co., Leg Irons, \$25.00 # doz 10%
 Tower's.....25%
 Daley's Improved Handcuffs, 2 Hands, Polished, # doz, \$48.00; Nickleplated, 3 hands, Polished, # doz, \$72.00; Nickleplated, \$84.00.....25%
 J. P. Lovell's Police Goods.....25%

Polish—**Metal—**

Prestoline Paste.....30%
 Prestoline Paste.....33%
 Gaston's Silver Compound.....33%

Stove—

Joseph Dixon's.....# gro, \$6.00, 10%
 Gem.....# gro, \$4.50, 10%
 Gold Medal.....# gro, \$6.00, 25%
 Dextro.....# gro, \$3.75
 Ruby.....# gro, \$3.75
 Rising Sun, 6 gro lots.....# gro \$5.50
 Dixon's Plumbago.....# d 8¢
 Boynton's Noon Day.....# gro \$13.00
 Parlor Pride Stove Enamel, # gro Yates' Liquid, 2 3 5 10 gal # gal.....\$0.50 70 80 50
 Yates Standard Paste Polish, 10 d cans.....# d 12¢
 Jet Black.....# gro \$5.50
 Japanese.....# gro \$3.50
 Fireside.....# gro \$2.50
 Diamond O. K. Enamel.....# gro \$19.00
 Bonnell's Liquid Stove Polish.....# gro \$4.00
 Bonnell's Paste Stove Polish.....# gro \$6.00
 Black Eagle Benzine Paste, 5 and 10 d cans.....12¢
 Black Jack Water Paste, 5 and 10 d cans.....12¢
 Nickel Plate Paste.....# gro \$6.00
 Crown Paste.....# gro \$7.20
 Crown Paste in 5 and 10 lb pails.....# d 13¢
 Black Flag.....# gro \$7.20
 Black Flag, 5 and 10 lb pails.....# d 12¢
 Black Flag, liquid, in bottles, # gro \$6.00
 Diamond Rock Nickel Cleaner.....# gro \$10.20

Raven Paste:

5-lb. pails, (per case of 6 or 12), # d 12¢
 Less than case.....# d 15¢
 Liquid, 6 oz. bottles.....# gross, \$8.00
 Liquid, 8 oz. bottles.....# gross, \$9.00
 Water Polish.....# gross, \$5.85

Poppers, Corn—

Round or Square, 1 qt., # gr \$10.00 to \$10.50
 Round or Square, 1 1/2 qt., # gr \$15.00 to \$15.50
 Round or Square, 2 qt., # gr \$18.50 to \$19.00

Post Hole and Tree Augers and Diggers—

See Diggers, Post Hole, &c.

Potato Parers—

See Parers, Potato.

Pots—**Glue—**

Presses—

Fruit and Jelly—	
Enterprise Mfg. Co.	25%
Hemis.	doz \$3.50
Shepard's Queen City	40%
Silver & Co.	doz \$2.75

Pruning Hooks and Shears—See Shears.**Pullers Nail—**

Scranton.	doz., \$18.00, 33%
Curtis Hammer.	doz., \$18.00, 30%
Giant, No. 1.	doz., \$18.00, 10%
Giant, No. 2.	doz., \$15.00, 10%
Pelican.	doz., \$20.00, 25%
Eclipse.	Each, \$2.00 net
Economy.	doz., \$6.00

Pulleys—

Hot House, Avning, &c.	60% @ 70%
Japanese Screw.	60% @ 10%
Brass Screw.	60% @ 10%
Japanese Side.	60% @ 10%
Japanese Clothes Line.	60% @ 10%
Moore's Sash, Anti-Friction.	50%
Hay Fork, Solid Eye, 4.00.	Swivel
Hay Fork, "Anti-Friction," 5 in. solid.	4.50
Hay Fork, "F" Common and Patent.	5.00
Bushed.	2.00
Hay Fork, Tarbox Pat. Iron.	2.00
Hay Fork, Reed's Self-Lubricating.	60%
Shade Rack.	45%
Tackle Blocks—See Blocks.	
Moore's Anti-Friction 5 in. Wheel.	40%
doz., \$12.00.	40%
Shepard's Niagara, No. 25.	30%
Sash (Auger Mortise).	
Common Sense.	60%
Empire.	60%
Ideal, Nos. 2, 4, 10 & 15.	60% less 1¢
Acme.	doz net
Star.	
On bbl. lots extra 5¢.	
Ideal, Nos. 25 and 55.	doz. 22¢ net.

Pumps—

Claster, Best Makers.	60% @ 10%
Pitcher Spout, Best Makers.	60% @ 10%
Pitcher Spout, Cheaper G'ds.	75% @ 10%

Punches—

Saddler's or Drive, good.	doz., 60% @ 65%
Bemis & Call Co.'s Cast Steel Drive.	50% @ 65%
Bemis & Call Co.'s Springfield Socket.	50% @ 65%
Spring, good quality.	doz., \$2.50 @ \$2.60
Spring, Leach's Pat.	15%
Bemis & Call Co.'s Spring and Check.	40%
Solid Timmers, P., S. & W. Co.	doz., \$1.44
Timmers' Hollow Punches, P., S. & W. Co.	20% @ 25%
Rice Hand Punches.	15%
Avery's Revolving.	40%
Avery's Sawset and Punch—See Sawsets	

Rail—

Sliding Door, Wrt Brass.	doz. 35¢, 40%
Sliding Door, Bronzed Wrt Iron.	35¢, 7¢
Sliding Door, Iron, Painted.	ft., 4¢, 40%
Barn Door, Light. In.	3¢, 3¢
Per 100 feet.	\$2.00 2.50 3.10, 10%
B. D. for N. E. Hangers—	
Small. Med. Large.	
Per 100 feet.	\$3.15 2.70 3.25 Net
Terry's Steel Rail.	ft., 7¢
Victor Track Rail, 7¢ ft.	50% @ 25%
Carrier, double braced, Steel Rail.	ft., 3¢, 40%
Moore's Wrought Iron.	25¢ @ 25%
Moody Steel Rail, ft., 5¢.	45%

Rakes—

Cast Steel, Association G'ds.	70% @ 75% & 2¢
Cast Steel, outside G'ds.	70% @ 75% & 2¢
Malleable.	70% @ 75% & 2¢
Gibbs' Lawn Rake.	doz., \$4.00
Gibbs' Canton Lawn Rake.	doz., \$3.75
Gibbs' Acme Lawn Rake.	doz., \$4.75
Gibbs' Favorite Lawn Rake.	doz., \$3.90
Gibbs' Crown Lawn Rake, No. 1.	doz., \$4.90
doz., \$4.90.	2¢, \$3.40
Onella Lawn Rake.	doz., \$4.00
Fort Madison Prize Bow Brace and	
Peelless.	65%
Fort Madison Steel Tooth Lawn Rake.	\$6.00, 25%

Razors—

J. R. Torrey Razor Co.	20%
Wostenholme and Butcher, \$10 to 2.	10%
Jordan's A.A.I. new list.	Net
Jordan's Old Faithful, new list.	Net
Galvanic.	doz., \$15.00
Electric Cutlery Co.	Net
Campbell Cutlery Co.	60%

Razor Straps—

See Straps, Razor.

Rings and Ringers—

Bull Rings—	
Union Nut Co.	55%
Sargent's.	75% @ 10%
Hotchkiss' low list.	30%
Humason, Beckley & Co.'s.	70% @ 10%
Peck, Stow & W. Co.'s.	50% @ 10% & 10%
Elrich Haw. Co., White Metal, low list.	50% @ 10% & 10%

Hog—

Top of the Hill Ringers.	doz \$2.00
Top of the Hill Ringers.	doz \$1.25
Hill's Improved Ringers.	doz \$1.25
Hill's Old Style Ringers.	doz \$1.12 1/2
Hill's Tongs.	doz \$3.00
Hill's Ringers.	doz bxs \$1.00
Perfect Ringers.	doz bxs \$1.50
Perfect Ringers.	doz \$2.15 @ \$2.25
Blair's Hog Ringers.	doz \$2.00
Blair's Hog Ringers.	doz 90¢ @ \$1.00
Champion Ringers.	doz \$2.00
Champion Ringers, Double.	doz \$2.25
Brown's Ringers.	doz \$2.00
Brown's Ringers.	doz \$1.16 @ \$1.25
Electric Hog Ringers.	doz \$2.00
Major Ringers.	doz \$1.25
Major Ringers.	doz \$2.00

Rivets and Burrs—

Iron, list Nov. 17, '87.	00% @ 10%—
Copper.	00% @ 10%
Coppered Iron, Bettina Brand.	40%

Rivet Sets—See Sets.**Rods—**

Stair, Brass.	25 @ 30%
Stair, Black Wainut.	doz 40%

Rollers—

Barn Door, Sargent's list.	60% @ 10% & 10%
Acme Moore's Anti-Friction.	55%
Union Barn Door Roller.	70%
Thompson Mfg. Co.'s own Roll rs.	30%

Rope—The following prices are f.o.b., New York or factory, and are shaded 1¢ @ 1¢ on large lots; terms, 1½ % for cash.

Manila, 7-16 in. diam. and larger.	doz 9%
Manila, 3/4 in. and 5-16 in.	doz 10%
Manila, 1/4 in. and 5-16 in.	doz 10%
Manila, Tarred Rope.	doz 9 1/2%
Manila, Hay Rope.	doz 9 1/2%
Sisal.	doz 7 1/2%
Sisal.	doz 8 1/2%
Sisal, Hay Rope.	doz 7 1/2%
Sisal, Tarred Rope.	doz 7 1/2%
Sisal, Medium Lath Yarn.	doz 7 1/2%
New Zealand, 7-16 in. & larger.	doz 6 1/2%
New Zealand, 3/4 in. & larger.	doz 7 1/2%
New Zealand, 1/4 in. and 5-16 in.	doz 7 1/2%
New Zealand, Hay Rope.	doz 6 1/2%
New Zealand, Tarred Rope.	doz 6 1/2%
Cotton Rope.	doz 13 1/2 @ 15 1/2
Jute Rope.	doz 6 1/2 @ 7 1/2

Wire—

List February, 1892. All kinds. 45%

Rules—

Boxwood.	80% @ 10%
Ivory.	60% @ 10%
Starrett's Rules and Straight Edges.	25% @ 10%

Sad Irons—See Irons, Sad.**Sand and Emery Paper and Cloth—**

See Paper and Cloth.

Sash Cord—See Cord, Sash.**Sash Locks—See Locks, Sash.****Sash Weights—**

See Weights, Sash.

Sausage Stuffers or Fillers—See Stuffers or Fillers,

Sausage.

Saws—The following prices are generally cut by jobbers.

Disston's Circular.	45% @ 45% & 5%
Disston's Cross Cut.	40% @ 40% & 5%
Disston's Hand.	25%
Woodrough & McParlin.	
Hand, Panel and Rip.	30% @ 30% & 5%
Narrow Champion Cross Cuts with	
Handles, ft.	18 @ 20¢
Champion Thin Back Cross Cuts,	
ft.	20 @ 28¢
Champion Extra Thin Back Cross	
Cuts, ft.	28 @ 31¢
One Man Champion Cross Cuts,	
ft.	37 @ 40¢
Wheeler, Madden & Clemson Mfg. Co.	
Hand, Panel and Rip.	35% @ 35% & 5%
Narrow Champion Cross Cuts with	
Handles, ft.	18 @ 20¢
Champion Thin Back Cross Cuts,	
ft.	26 @ 28¢
Champion Extra Thin Back Cross	
Cuts, ft.	29 @ 31¢
One Man Champion Cross Cuts,	
ft.	37 @ 39¢
Atkins' Circular.	50%
Atkins' Cross Cuts, new list.	40%
Atkins' Mulay, Mill and Drag.	40%
Atkins' One-Man Saw.	40%
Peace Circular and Mill.	45% @ 45% & 5%
Peace Hand Panel and Rip.	25% @ 25% & 5%
Peace Cross Cuts.	45% @ 45% & 5%
Richardson's Circular and Mill.	45% @ 45% & 5%
Richardson's X Cuts.	45% @ 45% & 5%
Richardson's Hand, &c.	25% @ 25% & 5%
C. E. Jennings & Co. brand.	25%

Hack Saws—

Griffin's, complete.	40% @ 10% & 50%
Griffin's Hack Saw Blades.	40% @ 10% & 50%
Star Hack Saws and Blades.	25%
Eureka and Crescent.	25%

[Scroll—

Lester, complete, \$10.00.	25%
Rogers, complete, \$4.00.	25%
Barnes' Builders' and Cabinet Makers' \$15.25.	25%
Barnes' Scroll Saw Blades.	35%

Saw Frames—

See Frames, Saw.

Saw Sets—See Sets, Saw.**Saw Tools—See Tools, Saw.****Scales—**

Hatch, Counter, No. 171, good quality.	doz \$18.00 @ \$19.00
Hatch, Tea, No. 161.	doz \$6.50 @ \$7.00
Union Platform, Plain.	\$2.10 @ 2.20
Union Platform, Striped.	\$2.40 @ 2.50
Chatillon's Grocers' Trip Scales.	60%
Chatillon's Eureka.	25%
Chatillon's Favorite.	40%
Family, Turnbills.	30% @ 30% & 10%
Riehle Bros' Platform.	40%

Scale Beams—

See Beams, Scale.

Scissors, Fluting—45%**Scrapers—**

Adjustable Box Scraper (S. R. & L. Co.)	\$6.00, 30% @ 10%
Box, 1 Handle.	doz \$2.25 @ \$2.50
Box, 2 Handle.	doz \$3.00 @ \$3.25
Defiance Box and Ship.	20% @ 10%
Foot.	50% @ 10% & 80%
Ship, Common.	doz \$3.50 net
Ship, R. I. Tool Co.	10%

Screen Window and Door

Frames—See Frames

Screw Drivers—

See Drivers, Screw

Screws—**Bench and Hand—**

Bench, Iron.	55% @ 10% & 55% @ 10%
Bench, Wood, Beech.	doz \$2.25
Bench, Wood, Hickory.	20% @ 10%
Hand, Wood.	25% @ 10% & 25% @ 10%
Hand, Grand Rapids, list.	35%

Coach, Lag and Hand-Rail—

Lag, Blunt Point, list Jan. 1, 1890.	80% @ 80% & 10%
Coach and Lag, Glimet Point, list Jan. 1, 1890.	80% @ 80% & 5%
Hand Rail, Sargent's.	70% @ 10%
Hand Rail, H. & B. Mfg. Co.	70% @ 10% & 75%
Hand Rail, Am. Screw Co.	75%

Jack Screws—

Jack Screws, Millers Falls list.	50% @ 50% & 10%
Jack Screws, P. S. & W.	35%
Jack Screws, Sargent.	70%
Jack Screws, Stearns.	40% @ 40% & 10%

Cork—

Humason & Beckley Mfg. Co.	40% @ 10% & 50%
Williamson's.	33% @ 33% & 5%

Machine—

Flat Head Iron.	65%
Round Head Iron.	60%

Wood—

List January 1, 1891.	
Flat Head Iron.	70%
Round Head Iron.	65%
Flat Head Brass.	70%
Round Head Brass.	65%
Flat Head Bronze.	70%
Round Head, Bronze.	65%
Rogers' Drive Screws.	82% @ 5%

Scroll Saws—See Saws, Scroll.**Scythes—**

Grain.	40% @ 50% & 40% @ 10%
Grass.	40% @ 10% & 50%

Scythe Snaths—

See Snaths, Scythe.

Sets—

Awl and Tool—	
Alken's Sets, Awls and Tools.	
No. 20, doz \$10.00.	60% @ 60% & 5%
Fray's Ad. Tool Hdl's, Nos. 1, \$12; 2, \$18;	
3, \$12; 4, \$9.	45%
Millers Falls Ad. Tool Hdl's.	
No. 1, \$12; 2, \$18.	25%
Henry's Combination Haft.	doz \$6.50
Stanley's Excelsior.	
No. 1, \$7.50; No. 2, \$4.00; No. 3,	
\$5.50.	30% @ 10%
Common Brad Sets,	
No. 42, \$10.50; No. 43, \$12.50.	70% @ 10% & 5%

Nail—

Square.	gr. \$4.00 @ \$4.25
Round.	gr. \$3.25
Buck Bros.	27% @ 2%
Cannon's Diamond Point.	gr. \$12, 20%

Rivet—

Regular list.	70%
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Saw—

Stillman's Genuine.	doz \$5.00 @ 7.75,
	40% @ 5%
Stillman's Pattern, Hand, doz \$3.25.	
Cross Cut, \$5.25.	55%
Common Lever.	doz \$2.00, 45% @ 50%
Morrill's No. 1, \$15.00.	40% @ 20%
No. 11, \$15.00.	40% @ 10% & 40% @ 10% & 5%
Nos. 3 and 4, \$18.00.	40% @ 5%
No. 5, \$24.00.	40% @ 5%
Leach's, No. 0, \$8.00; No. 1, \$15.15 @ 20%	
Nash's.	20% @ 10% & 20% @ 10% & 10%
Hammer, Hotchkiss.	\$5.50, 10%
Hammer, Bemis & Call Co.'s new Pat.	30% @ 5%
Bemis & Call Co.'s Lever and Spring	
Hammer.	30% @ 5%
Bemis & Call Co.'s Plate.	10%
Bemis & Call Co.'s Cross Cut.	12% @ 5%
Alken's Genuine.	\$13.00, 50% @ 10% & 60%
Alken's Imitation.	\$7.00, 65% @ 5%
Hart's Pat. Lever.	20%
Disston's Star.	20%
Leopold.	40% @ 10% & 50%
Atkin's Lever.	doz No. 1, \$6.00
Atkin's Criterion.	doz No. 1, \$6.00
Crosscut (Keller), No. 1, \$15.00; No. 2,	
\$24.00.	40% @ 10%
Avery's Saw Set and Punch.	50%
Kohler's Royal.	doz \$7.00
Kohler's Giant Royal.	doz \$12.00
Crescent.	doz \$3.00
Lloyd's Acme.	doz \$15, 40% @ 10%
Taintor Positive.	doz \$18, 50%

Sharpeners, Knife—

Larkins'.	Applewood Handles. doz. \$6.00, 40%
Rosewood or Cocobola.	doz. \$9.00 40%

Shaves, Spoke—

Wood.	45%
Wood, (Stanley R. & L. Co.)	40% @ 10%
Stearns'.	30% @ 10%
Cincinnati.	25% @ 10%
Goodell's doz. \$9.00.	25%

Shears—

American (Cast) Iron.....	75% @ 10% & 75% @ 10% & 5%
Barnard's Lamp Trimmers.....	doz. \$3.75
Seymour's, List Dec. 1881.....	60% @ 10% & 60% @ 10% & 10% & 5%
Hemisch's, List Dec. 1881.....	60% @ 10% & 60% @ 10% & 10% & 5%
Hemisch's Tailor's Shears.....	33% @ 5%
Cast Steel Trimmers.....	
First quality.....	80% @ 10% & 10%
Second quality.....	80% @ 10% & 80% @ 10% & 10%
Acme Cast Shears.....	10% @ 10%
Diamond Cast Shears.....	10%
Clipper.....	10% @ 10%
Saw.....	75% @ 10%
Howe Bros. & Hulbert, Solid Forged Steel.....	40%
Chicago Drop Forge & F. Co, Solid Steel Forged.....	60%
Davenport Cutlery Co.....	60% @ 60% @ 10%
Clauss Shear Co, Japaned.....	70%
Clauss Shear Co, Lickered, same list.....	60%
Galvanic 3 1/2 to 9 in., 7/8 doz. 1st 60%.....	60%
Electric Cutlery Co.....	75%
Campbell Cutlery Co., Jap'd.....	75%
Nickel Plated.....	65%

Snaps, Harness, &c.

Anchor (T. & S. Mfg. Co.)	55¢
Fitch's (Bristol)	50¢ to 10¢
Hotchkiss	10¢
Andrews	50¢
Sargent's Patent Guarded	70¢ to 10¢
German, new list	40¢ to 10¢
Covert, New Patent	50¢ to 10¢
Covert, New R. E.	80¢ to 10¢
Covered Spring	60¢ to 10¢
Covert's Saddlery Works' Triumph	33¢ to 4¢
John Protz Snaps	75¢ to 75¢

Snaths, Scythe-

List	50¢ to 50¢
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Soldering Irons-See *Irons, Soldering.***Spittoons, Cuspidors, &c.**

Standard Fiberglass	
Cuspidors, 8 1/2-inch, No. 5, 8; No. 6, 9	
Spittoons, Daisy, 8-inch, No. 1, 4; 10 and 11 inch, 9¢	

Spoke Shaves-See *Shaves, Spoke.***Spoke Trimmers-**See *Trimmers, Spoke.***Spoons and Forks-**

Tinned Iron-

Basting, Cen. Stamp. Co.'s list	70¢ to 10¢
Solid Table and Tea, Cen. Stamp. Co.'s list	70¢ to 10¢
Buffalo, S. S. & Co.	33¢ to 2¢

Silver Plated-

months or 5¢ cash 30 days:	
Meriden Brit. Co., Rogers	40¢ to 15¢
C. Rogers & Bros.	40¢ to 15¢
Rogers & Bros.	40¢ to 15¢
Rogers & Barton	40¢ to 15¢
Wm. Rogers Mfg. Co.	40, 15¢ & 5¢
Simpson, Hall, Miller & Co.	40, 15¢ & 5¢
Holmes & Edwards Silver Co.	40, 15¢ & 5¢
L. Boardman & Son	50¢ to 12¢

Miscellaneous-

No. 47 Mexican Silver	50¢ to 10¢
No. 30 Silver Metal	50¢ to 10¢
No. 24 German Silver	50¢ to 10¢
No. 50 Nickel Silver	50¢ to 10¢
No. 49 Nickel Silver	50¢ to 10¢

Wm. Rogers Mfg. Co.	50¢ to 10¢
Rogers Silver Metal	50¢ to 10¢
15¢ Rogers' German Silver	50¢ to 10¢
25¢ Rogers' Nickel Silver	50¢ to 10¢

German Silver	50¢ to 5¢
German Silver, Hall & Elton	50¢ to 5¢ cash
Nickel Silver	50¢ to 5¢
Britannia	80¢ to 60¢
Boardman's Nickel Silver, list July 1, 1891	60¢ to 7¢
Boardman's Britannia Spoons, case lots	60¢ to 5¢ cash

Springs-

Door-

Torrey's Rod, 39 in.	5¢ doz \$1.20 to 1.25
Gray's, gr. 39 in.	25¢
Bee Rod, gr. 39 in.	20¢ to 25¢
Warner's No. 1, 39 in.	15¢ to 25¢
39 in.	50¢ to 55¢
Gem (Coll), list April 19, 1886	10¢ to 15¢
Star (Coll), list April 19, 1886	20¢ to 25¢
Victor (Coll)	60¢ to 10¢
Champion (Coll)	60¢ to 10¢
Cowell's, No. 1, 39 in.	15¢ to 10¢
Rubber, complete, 39 in.	55¢ to 10¢
Hercules	50¢ to 50¢

Carriage, Wagon, &c.

Elliptic, Concord, Platform and Half	
Scroll	60¢ to 10¢
Cliff's Bolster Springs	25¢

Squares-

Steel and Iron	85¢ to 85¢
Nickel-Plated	85¢ to 85¢

Try Square and T Bevels	60¢ to 10¢
Diston's Try Square and T Bevels	60¢
Winterbottom's Try and Miter	30¢ to 10¢
Starrett's Micrometer Caliper Squares	25¢

Avery's Flush Bevel Squares	40¢
Avery's Bevel Protractor	60¢

Squeezers-

Fodder-

Blair's	5¢ doz \$2.00
Blair's "Climax"	5¢ doz \$1.25

Lemon-

Porcelain Lined, No. 1	5¢ doz \$3.00
Wood, No. 2	25¢ to 30¢
Wood, Common	5¢ doz \$1.70 to 1.75
Dunlap's Improved	5¢ doz \$3.75 to 2.00
Bamnis	No. 1, 5¢; No. 2, 3¢; 12¢
118 # doz	25¢ to 10¢
Jennings' Star	5¢ doz \$2.50
The Boss	5¢ doz \$2.50
Dean's	Nos. 1, 5¢; 2, 3¢; 3, 1.90; Queen, 2.50

Little Giant	50¢ to 50¢
King	40¢ to 5¢
Hotchkiss Straight Flash	5¢ doz \$12.00
Silver & Co., Glass	5¢ doz \$9.00
Manny Lemon Juice Extractor	5¢ doz \$1.00
Standard	5¢ doz \$0.75 to \$1.00
Improved	5¢ doz \$2.00

Standard Fiber Ware-See *Ware, Standard Fiber.***Staples-**

Blind-

Barbed, 1/4 in. and larger	7¢ to 7 1/2¢
Barbed, 1/4 in.	8¢ to 8 1/2¢
Fence Staples, Galvanized	Same price
Fence Staples Plain	See <i>Frd. Rd.</i>
Steel Yards	40¢ to 50¢

Stocks and Dies-

Blacksmith's	
Waterford Goods	35¢
Butterfield's Goods	35¢
Lightning Screw	25¢ to 30¢
Bece's New Screw Plates	25¢ to 30¢
Reversible Ratchet	30¢
Gardner	25¢
reen River	25¢ to 30¢

Stops, Bench-

Morrill's	5¢ doz \$3.00
Hotchkiss's	5¢ doz \$5.10 to 10¢
Veston's, No. 1, 10; No. 2, 30, 25¢ to 10¢	
M. G. P.'s	5¢ doz \$3.00
Cincinnati	25¢ to 10¢
Terrell's Nos. 1 and 2, 5¢ doz, 3¢; No. 3, 3.60	

Stone-Stones, Grind-See *Grindstones.***Scythe Stones-**

Pike Mfg. Co., list April, 1892	33¢ to 4¢
Cleveland Stone Co., list Nov. 1892	33¢ to 4¢

Oil Stones, &c.

Pike Mfg. Co.	
Hindostan No. 1, 5¢	8¢
Sand Stone	5¢
Turkey Oil Stone, 4 to 6	40¢ to 40¢
Turkey Slips	2.00
Washita Stone, Extra	50¢
Washita Stone, No. 1	40¢
Washita Stone, No. 2	30¢
Washita Slips, Extra	80¢
Washita Slips, No. 1	70¢
Arkansas Stone, No. 1, 3 to 5 in.	5.30
Arkansas Stone, No. 1 1/2 to 8 in.	3.50
Lake Superior	13¢
Lake Superior Slips	20¢

Stove Polish-See *Polish, Stove.***Stretchers Carpet-**

Cast Steel, Polished	5¢ doz \$2.2
Cast Iron, Steel Points	5¢ doz \$2.50
Socket	5¢ doz \$1.75
Bullard's	25¢ to 25¢

Strops, Razor-

Genuine Emerson	60¢ to 60¢
Imitation	20¢ to 10¢
Torrey's	20¢
Badger's Belt and Com.	5¢ doz \$2.00
Lamont Combination	5¢ doz \$4.00
Jordan's Pat. Padded, list Nov. 1, '89	50¢
Electric Cutlery Co.	Net
Campbell Cutlery Co.	Net

Stuffer, Sausage-

Miles' Challenge	5¢ doz \$2.00
Perry	5¢ doz, No. 1, \$15.00; No. 0, \$21.00
Draw Cut No. 4, each \$30.00	20¢
Enterprise Mfg. Co., list Jan. 17, '92	25¢
Silver's	40¢ to 10¢

Sweepers, Carpet and Lawn-

Bissell No. 5	5¢ doz \$17.00
Bissell No. 8	5¢ doz \$20.00
Bissell, Grand	5¢ doz \$38.00
Standard	5¢ doz \$24.00
Domestic	5¢ doz \$21.00
Domestic, 2	5¢ doz \$22.00
Grand Rapids	5¢ doz \$24.00
Crown Jewel, No. 1, \$18.00; No. 2, \$19.00; No. 3, \$20.00	
Magie	5¢ doz \$15.00
Improved Parlor Queen	5¢ doz \$27.00
Nickel	5¢ doz \$24.00
Excelsior	5¢ doz \$22.00
Garland	5¢ doz \$18.00
Parlor Queen	5¢ doz \$24.00
Housewife's Delight	5¢ doz \$15.00
Queen	5¢ doz \$18.00
Queen, with band	5¢ doz \$18.00
Domestic	5¢ doz \$22.00
Weed, Improved	5¢ doz \$18.00
Hub	5¢ doz \$16.00
Cog-Wheel	5¢ doz \$16.00
Ladies' Friend	5¢ doz \$15.00
Ladies' Friend No. 2	5¢ doz \$16.00
Advance	5¢ doz \$18.00
Our Leader	5¢ doz \$19.00
Triumph	5¢ doz \$20.00
Model	5¢ doz \$27.00
Goshen	5¢ doz \$21.00
Supreme	5¢ doz \$22.00
Easy	5¢ doz \$22.00
Gilt Edge	5¢ doz \$24.00
Acme	5¢ doz \$26.00
Imperial	5¢ doz \$30.00
Grand Republic	5¢ doz \$30.00
Banner	5¢ doz \$22.00
The Star	5¢ doz \$21.00
Reliable	5¢ doz \$22.00
The Rapid	5¢ doz \$22.00
Our Own	5¢ doz \$27.00
Model	5¢ doz \$27.00
Goshen Sweeper Company	
Rapids, Mich., make the following rates:	
5 dozen in 6 months	5¢ doz \$1.00
10 dozen in 6 months	5¢ doz \$2.00
25 dozen in 6 months	5¢ doz \$3.00
Exception L.F., when 10 dozen price is \$13.50, and 25 dozen \$13.00.	

Lawn-

Thompson Mfg. Co. 30¢

Tacks, Brads &c.

List October 19, 1889. Old established straight weights. Short Weight goods are sold at lower prices.

Carpet Tacks	
American Blued	60¢
American Pin'd and Cop'd	70¢
Steel, Bright and Blued	60¢
Steel, Tinned and Coppered	70¢
Swedes Iron, Blued	72¢
Swedes Iron, Tinned	75¢
American Iron Tacks, Domestic	60¢
Swedes Iron Tacks	
S. S., Blued	60¢
S. S., Tinned	70¢
Lanc., Blued	55¢
Lanc., Tinned	60¢
Gimp and Lace Tacks	
S. S., Blued	62¢
S. S., Tinned	60¢
Lanc., Blued	60¢
Lanc., Tinned	60¢
Basket and Trimmers' Tacks	
Lanc.	52¢
S. S.	60¢
Hungarian Nails	60¢
Common and Patent Brads	55¢
Leathered Tacks	60¢
Brush Tacks, S. S.	60¢
Looking Glass Tacks, S. S.	35¢
Picture-Frame Points, S. S.	35¢
Finishing Nails	60¢
Trunk and Clout Nails	
Black	62¢
Tinner's or Coppered	60¢
Basket Nails	60¢
Chair Nails	52¢
Cigar Box Nails	45¢
Tin Capped Nails	50¢

Miscellaneous-

Double Point	90¢ to 90¢
Wire Carpet Nails	50¢ to 10¢
Plymouth Rock Steel Carpet Tacks	25¢
Upholsterers' Nails	40¢

Wire Brads and Nails-

Steel-Wire Brads, R. & E. Mfg. Co.'s list	50¢ to 10¢
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See also *Nails, Wire.***Tapes, Measuring-**

American	40¢ to 40¢
Spring	40¢
Chesterman's, Regular list	25¢ to 30¢

Thermometers-

Tin Case	80¢ to 80¢
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Thimble Skeins-See Skeins.**Ties, Bale-Steel.**

Standard Wire, list	50¢ to 10¢
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Tinners' Shears, &c -See *Shears, Tinners' &c.***Tinware-**

Stamped, Japanned and Piced, list Jan 20, 1887	70¢ to 10¢
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Tire Benders, Upsetters, &c.-See Benders and Upsetters, Tire.**Tobacco Cutters-**See *Cutters, Tobacco.***Tools-**

Coopers'-

Bradley's	20¢
Barton's	20¢ to 20¢
L. & J. White	20¢ to 5¢
Albertson Mfg. Co.	25¢
Beatty's	30¢
Sandusky Tool Co.	30¢ to 30¢
Shaves Cincinnati Tool Co.	20¢

Lumber-

Ring Peavies, "Blue Line"	5¢ doz \$20.00
Ring Peavies, Common	5¢ doz \$18.00
Steel Socket Peavies	5¢ doz \$21.00
Mail Iron Socket Peavies	5¢ doz \$19.00
Cant Hooks, "Blue Line"	5¢ doz \$16.00
Cant Hooks, Common Finish	5¢ doz \$14.00
Cant Hooks, Mail Socket Clasp, "Blue Line" Finish	5¢ doz \$16.00
Cant Hooks, Mail Socket Clasp, Common Finish	5¢ doz \$14.50
Cant Hooks, Clip Clasp, "Blue Line" Finish	5¢ doz \$14.00
Cant Hooks, Clip Clasp, Common Finish	5¢ doz \$12.00
Hand Spikes	5¢ doz 6 ft., \$15.00; 8 ft., \$20.00
Pike Poles, Pike & Hook	5¢ doz, 12 ft., \$11.50; 14 ft., \$12.50; 16 ft., \$14.50; 18 ft., \$17.50; 20 ft., \$21.50
Pike Poles, Pike only	5¢ doz, 12 ft., \$10.00; 14 ft., \$11.00; 16 ft., \$13.00; 18 ft., \$16.00; 20 ft., \$20.00
Pike Poles, not ironed	5¢ doz, 12 ft., \$9.00; 14 ft., \$10.00; 16 ft., \$11.00; 18 ft., \$13.00; 20 ft., \$16.00
Setting Poles	5¢ doz, 12 ft., \$14.00; 14 ft., \$15.00; 16 ft., \$17.00
Swamp Hooks	5¢ doz \$18.00

Saw-

Atkins', new list	40¢
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Transom Lifters-See *Lifters, Transom.***Traps-Game-**

Newhouse	40¢ to 40¢
Onella Pattern	70¢ to 10¢
Game, Blake's Patent	40¢ to 10¢

Mouse and Rat-

Mouse Wood Choker	5¢ doz holes, 9 to 10¢
Mouse, Round Wire	5¢ doz \$1.50
Mouse, Cage, Wire	5¢ doz \$2.50
Mouse, Catch-em-alive	5¢ doz \$2.50
Mouse, Bonanza	5¢ doz \$0.90 to \$1.00
Rat, Decoy	5¢ gr \$10.00, 10¢
Ideal	5¢ gr \$10.00
Cyclone	5¢ gr \$5.25
Hotchkiss Metallic Mouse	5¢ doz \$6.00 to 65¢
Hotchkiss Imp. Rat Killer	5¢ gr \$18.50
Hotchkiss New Rat Killer	5¢ gr \$16.50
Schuyler's Rat Killer	5¢ gr \$15.00
Dandy	5¢ doz, \$1.75

Triers-

Butter and Cheese	25¢
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Trimmers, Spoke-

Bonney's	5¢ doz \$10.00, 50¢
Stearns'	20¢ to 10¢
Ives', No. 1, \$15.00; No. 2, \$12.00	
Douglas'	55¢ to 10¢
Cincinnati	25¢

Trowels-

Lothrop's Brick and Plastering	20¢ to 10¢
Reed's Brick and Plastering	15¢
Diston's Br'k and Plastering	25¢ to 25¢
Peace's Plastering	25¢ to 25¢
Clement & Maynard's	20¢ to 20¢
Rose's Br'k	15¢ to 25¢
Brade's Brick	25¢
Worrall's Brick and Plastering	20¢
Garden	70¢
Cleves' Angle Trowel	5¢ gr, No. 1, \$36; No. 2, \$30; No. 3, \$15. net @ 10¢

Trucks, Warehouse, &c.

B. & L. Block Co.'s list	40¢
Thompson Mfg. Co.	25¢

Tubes,

Whips

American Whip Co.: Length.	4½	5	5½	6	6½	7	7½	8 ft.
I. X. L. Whalebone Driving	\$18.00	20.00	22.00	24.00	27.00	30.00	33.00	36.00
Eureka, Two-thirds Whalebone	15.00	16.50	18.00	20.00				
Bull Bone, Half-length Whalebone			11.00	12.00	13.00	15.00		
American Standard	8.00	8.50	9.50	10.50	12.00	13.50	15.00	16.50
True Grip, Raw Hide Center	6.00	6.00	6.50	7.00	7.50	9.00		
New Name, Stocked Java, Black and Wine Colors				6.00				
Americus, 98 Pen Whip				6.00				
Gents' Light Driving No. 113				6.00				
Gents' Light Driving No. 106				5.00				
Hand-made Stocked Java No. 103			3.75	4.00				
A large variety of cheaper grades							50¢ to \$3.00	
Team Whips							\$2.00 to \$7.50	
Toy Whips							\$2.50 to \$12.00	
Hardware Assortment, 10 American, 75 Whips for \$50.00.								

Wire and Wire Goods—**Iron—**

Market,								
Br. & Ann., Nos. 0 to 18.								
75¢ to 10¢ to 18.75¢ to 5¢								
Cop'd, Nos. 0 to 18.								
Galv., Nos. 0 to 18.								
70¢ to 10¢ to 18.75¢ to 5¢								
Tin'd, Tin'd list, Nos. 0 to 18.								
70¢ to 10¢ to 18.75¢ to 5¢								

Stone,								
Br. and Ann'd, Nos. 16 to 18.								
Bright and Ann'd, Nos. 16 to 18.								
Br. and Ann'd, Nos. 27 to 36.								
Tinned								
Tinned Broom Wire, 18 to 21.								
Galvanized Fence								
Brass, list Jan. 18, 1892.								
Copper, list Jan. 18, 1892.								
Ann'd Wire on Spools								

Malt's Annealed and Tin'd on Spools. 65¢
 Malt's Brass and Cop. on Spools. 55¢
 Tate's Spooled, Tin'd & Annealed. 60¢ to 55¢
 Tate's Spooled Cop. and Brass. 50¢
 Cast Steel Wire. 50¢
 Steel Music Wire, 12 to 30, imported. 60¢ to 70¢

Wire Clothes Line, see Lines.
 Wire Picture Cord, see Cord.

Bright Wire Goods—

Standard list. 80¢ to 20¢ to 85¢
 Wire Cloth and Netting—
 Painted Screen Cloth, good quality, 100 sq. ft., \$1.40
 Galvanized Wire Netting. 75¢ to 10¢

Wire, Barb—

See Trade Report.
 Wire Rope—See Rope, Wire.

Wrenches—

American Adjustable. 40¢
 Baxter's Adjustable "S". 40¢ to 10¢ to 50¢
 Baxter's Diagonal. 50¢
 Coes' Genuine. 50¢ to 10¢ to 30¢
 Coes' "Mechanics". 50¢ to 10¢ to 30¢
 Girard Standard. 65¢ to 10¢ to 70¢
 Lamson & Sessions' Engineers'. 60¢ to 10¢
 Lamson & Sessions' Standard. 70¢ to 10¢
 P. S. & W. Agricultural. 75¢ to 10¢ to 80¢
 Girard Agricultural. 75¢ to 10¢ to 80¢
 Lamson & Sessions' Agric'l. 75¢ to 10¢ to 80¢

Bemis & Call's:
 Pat. Combination. 40¢
 Merrick's Pattern. 25¢
 Briggs's Pattern. 40¢ to 50¢
 Cylinder or Gas Pipe. 40¢ to 50¢
 No. 3 Pipe. 50¢
 Aiken's Pocket (Bright). 50¢, 50¢ to 10¢
 The Favorite Pocket. 50¢, 50¢ to 10¢
 Webster's Pat. Combination. 25¢
 Boardman's. 25¢ to 10¢
 Always Ready. 50¢
 Aligatore. 20¢ to 10¢
 Donohue's Engineer. 20¢ to 10¢
 Acme, Bright. 50¢ to 10¢
 Acme, Nickle. 40¢ to 25¢
 Hercules. 70¢ to 10¢
 Walker's. 55¢ to 30¢
 Diamond Steel. 25¢ to 10¢
 Cincinnati Brace Wrenches. 55¢ to 10¢ to 25¢
 Taft's Vise Wrench. 55¢ to 10¢ to 25¢

Wringers, Clothes—

Am. Wringer Co.'s list, Jan. 2, '93. 2¢ cash
 Colby Wringer Co., list Sept. 1, '91. 2¢ cash
 Lovell Mfg. Co., list Jan. 1, 1892. 2¢ cash
 Peerless Mfg. Co., list Feb. 1, 1892. 2¢ cash
 National Wringer & Mfg. Co., list June 1, 1892. 2¢ cash

Wrought Goods—

Staples, Hooks, &c., list March 17, 1892. 85¢ to 10¢ to 85¢ to 15¢

Paints, Oils and Colors.—Wholesale Prices.

Animal and Vegetable**Oils—**

Linseed, City, raw, per gal.	48
Linseed, City, boiled	51
Linseed, Western, raw	48
Lard, City, Extra Winter	1.00
Lard, City, Prime	1.00
Lard, City, Extra No. 1	75
Lard, City, No. 1	60
Lard, Western, prime	95
Cotton-seed, Crude, prime	55
Cotton-seed, Crude, off grades	50
Cotton-seed, Summer Yellow, prime	60
Cotton-seed, Summer Yellow, off grades	55
Sperm, Crude	55
Sperm, Natural Spring	55
Sperm, Bleached Spring	85
Sperm, Natural Winter	87
Sperm, Bleached Winter	87
Whale, Crude	50
Whale, Natural Winter	50
Whale, Bleached Winter	53
Whale, Extra Bleached	55
Sea Elephant, Bleached	40
Menhaden, Crude, Sound	40
Menhaden, Crude, Southern	43
Menhaden, Light Pressed	40
Menhaden, Bleached Wter	46
Menhaden, Extra Bleached	46
Tallow, City, prime	60
Tallow, Western, prime	50
Cocunut, Ceylon	7
Cod, Domestic	38
Cod, Foreign	40
Red Elaine	40
Red Saponified	6
Bank	39
Straits	38
Olive, Italian bbls.	65
Neatsfoot, prime	65
Palm, prime, Lagos	6

Mineral Oils—

Black, 20 gravity, 25 @ 30	
cold test	7 @ 73¢
Black, 20 gravity, 15 cold	
test	73¢ @ 8
Black, 20 gravity, summer	6 @ 64¢
Cylinder, light, filtered	14 @ 16

Cylinder, dark, filtered	10 @ 13
Paraffine, 23½ @ 24 gravity	11½ @ 12
Paraffine, 25 gravity	10 @ 11
Paraffine, 28 gravity	7½ @ 8
Paraffine, red	9 @ 10½

Paints and Colors—

Barytes, Foreign, 10 ton	\$22.00 @ 24.00
Barytes, Amer. floated	29.00 @ 32.00
Barytes, Amer. No. 1	16.00 @ 18.00
Barytes, Amer. No. 2	13.00 @ 15.00
Barytes, Amer. No. 3	11.00 @ 12.00
Blue, Celestial	8 @ 8
Blue, Chinese	40 @ 50
Blue, Prussian	25 @ 40
Blue, Ultramarine	8 @ 25
Brown, Spanish	14 @ 1
Brown, Vandyke, Amer.	3 @ 3½
Brown, Vandyke, English	6 @ 8
Carmine, No. 40, in bulk	3.10 @
Carmine, No. 40, in boxes	3.20 @
or barrels	4.20 @
Chalk, in bulk	1 @ 1.75
Chalk, in bbls.	33 @ 40
China Clay, English	13.00 @ 18.00
Cobalt Oxide, prep'd	9.00 @ 11.00
Cobalt Oxide, black	1.90 @
Cobalt Oxide, black, less 100 lb.	1.96 @
Green, Paris, in bulk	10 @ 10½
Green, Paris, 170 @ 175 lb.	10½ @
kegs	10½ @ 11
Green, Paris, small pack	12 @ 17
Green, Chrome, ordinary	6 @ 12
Green, Chrom., pure	22 @ 25
Lead, Eng. B.B. white	8½ @ 10
Lead, Ann. White, dry or in oil	7 @ 7½
Kegs, lots less than 500 lb.	6½ @ 6¾
Kegs, lots 500 lb. to 5 tons	6¾ @ 6¾
Kegs, lots 5 tons to 12 tons	6¾ @ 6¾
Kegs, lots 12 tons and over	6¾ @ 6¾
Lead, White, in oil, 25 lb tin	1 @ ¾
Lead, White, in oil, 12½ lb tin	1 @ ¾
Lead, White, in oil, 1 to 5 lb as sorted tins, add to keg price	1 @ 1
Lead, Red, bbls. and ½ bbls.	6 @ 7
Lead, Red, kegs	6¼ @ 7¼
Litharge, kegs	6¼ @ 7¼
Litharge, bbls. and ½ bbls.	6 @ 7

TERMS, &c.—Lead and Litharge.—On lots of 500 lb or over, 60 days' time or 2½ % discount for cash if paid within 15 days of date of invoice.
 Ocher, Rochelle. 1.35 @ 1¼
 Ocher, French Washed. 1½ @ 2¼
 Ocher, German Washed. 1¼ @ 3
 Ocher, American. 1½ @ 1¼
 Orange Mineral, English. 8½ @ 9
 Orange Mineral, French. 10 @ 10½
 Orange Mineral, German. 8½ @ 9
 Orange Mineral, American. 8½ @ 8¾
 Paris White, English Cliff. 1.00 @ 1.15
 Paris White, American. 85 @ 75
 Red, Indian, English. 5½ @ 7
 Red, Indian, American. 2 @ 6¼
 Red, Turkey. 9 @ 14
 Red, Tuscan. 9 @ 11
 Red, Venetian, American. 1.00 @ 1.10
 Red, Venetian, English. 1.20 @ 1.35

Zinc, American, dry. 4½ @ 5
 Zinc, French, Red Seal. 7½ @
 Zinc, French, Green Seal. 9 @
 Zinc, French, V. M. X. 7½ @
 Zinc, Antwerp, Red Seal. 7½ @
 Zinc, Antwerp, Green Seal. 7½ @
 Zinc, German, Z. O. 6½ @
 Zinc, V. M. in Poppy Oil. 6½ @
 Seal, lots of 1 ton and over. 10½ @ 11½
 lots less than one ton. 11 @ 11½
 Zinc, V. M. in Poppy Oil, Red Seal. 10 @ 10½
 lots of 1 ton and over. 10 @ 10½
 lots of less than 1 ton. 10½ @ 10½
 Discounts.—French Zinc.—Discounts to buyers of 10 bbl. lots of one or assorted grades, 1½; 25 bbls., 2½; 50 bbls., 4½. No discount allowed on less than bbl. lots.

Colors in Oil—

Black, Drop, Frankfort	25 @ 30
Black, Drop, English	12 @ 15
Black, Drop, Domestic	7 @ 10
Black, Lampblack, Best	20 @ 35
Black, Lampblack, Common	7 @ 18
Black, Ivory	8 @ 15
Zinc, Chinese	35 @ 40
Blue, Prussian	20 @ 45
Blue, Ultramarine	12 @ 18
Brown, Vandyke	7 @ 12
Green, Chrome	8 @ 13
Green, Paris	16 @ 18½
Sienna, Raw	7 @ 14
Sienna, Burnt	7 @ 11
Umber, Raw	7 @ 10
Umber, Burnt	7 @ 10

Putty—

In barrels and ½ bbls.	.013¢ @ .013¢
In tubs	.013¢ @ .013¢
In tin cans	.013¢ @ .024¢
In bladders	.013¢ @ .024¢

Spirits Turpentine—

In regular bbls.	33½ @ 34
In machine bbls.	34 @ 34½

Glue—

Low Grade	8 @ 10
Cabinet	12 @ 14
Medium White	13 @ 15
Extra White	17 @ 20
French	10 @ 23
English	10 @ 15
Irish	12 @



Pacific Coast Representatives, CHAS. L. PIERCE & CO., 202 Market St., SAN FRANCISCO, CAL.
 Canadian Representative, H. D. SIMMONS, 85 York St., TORONTO, ONT.

FEBRUARY 1, 1893.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market report.

Bar Iron from Store—

List January 17, 1884.

Fine Numbers.

— % discount.
Spring Wire, 2¢ @ advance.

Per D. ()

Tobin Bronze-Rods.
Drawn Roas for Bolts, Forgings, &c.

Drawn Rods for Bolts, Forgings, &c

1/4 to 3/8 inches inclusive.....	17¢	per lb.
Over 3/8 to 5 inches inclusive.....	18¢	per lb.
<i>Piston Rods, Finished True, Smooth and Straight.</i>		
1/4 to 3/8 inches inclusive.....	18¢	per lb.
Over 3/8 to 5 inches inclusive.....	19¢	per lb.

Duty: Pig, Bars and Plates, \$1.50 @ 100 lb.
Western Spelter.....5¢ @ 51¼¢

Bertha (pure)..... 8¢@9 3/4¢

Zinc—

Duty: Sheet 21 1/2¢ @ 2¢

Duty: Sheet, $2\frac{1}{2}$ ¢ @ lb.
600 lb casks 7 ¢

Lead—
Duty : Pig, \$2 @ 100 lb. Old Lead, 24 @ lb. Pipe
and Sheets, 21⁶/₁₆ @ lb.

American Pig.....	4.2¢@4.50¢
Bar	4.74¢
Pipe, subject to discount 20%.....	6 1/4¢

Block 1 in Pipe, subject to discount 20%.....01 5/8
Sheet, subject to discount 20%..... 1 1/4
Old Lead in exchange, 3 1/4¢ @ 1 lb.

1/2 @ 1/2 (Guaranteed).....	13 1/2¢ @ 15¢
No. 1.....	11 3/4¢ @ 12 1/2¢

Prices of Solder indicated by private brands

Antimony—	
Cookson	12 1/2¢
Hallett's	12 1/2¢

Aluminum-
Duty: 15¢ ~~per~~ lb.
Guaranteed over 98 1/2% pure..... 30 lb .75

Old Metals—
Prices Paid in New York.

Heavy Copper.....	#	lb	10	9
Light and Tinned Copper.....	#	lb	9	9
Heavy Brass.....	#	lb	8	9
Light Brass.....	#	lb	8	6
Lead.....	#	lb	3	1
Tea Lead.....	#	lb	3	0
.....Zinc.....	#	lb	3	0
No. 1 Pewter.....	#	lb	14	7
No. 2 Pewter.....	#	lb	14	7
Wrought Scrap Iron.....	#	gross ton	\$17	00
Cast Scrap.....	#	gross ton	10	00
Sheet Plate Scrap.....	#	gross ton	10	00
Purist Iron.....	#	gross ton	5	00

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